The Amateur Orchid Cultivators' Guide Book.

By H. A. BURBERRY, F.R.H.S.

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THE

AMATEUR ORCHID CULTIVATORS' GUIDE BOOK.

NEW YORK
BOTANICAL
GARDEN

BY

H. A. BURBERRY, F.R.H.S.,

ORCHID GROWER AT HIGHBURY, BIRMINGHAM (THE RESIDENCE OF THE RIGHT HON. JOSEPH CHAMBERLAIN, M.P.)

CONTRIBUTOR OF THE FOLLOWING, VIZ.:
THE YEARLY CALENDAR OF OPERATIONS ON ORCHID CULTURE FOR THE "ORCHID REVIEW," 1894; THE ORCHID CALENDAR IN THE "GARDENERS' CHRONICLE," 1892; AND THE "GARDENERS' MAGAZINE" ORCHID CALENDAR FOR THE PRESENT YEAR, ETC., ETC.

WITH ILLUSTRATIONS.

LIVERPOOL:
BLAKE & MACKENZIE, PRINTERS AND PUBLISHERS.

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ORCHIDS:

How to grow them successfully.

THE writer of this little manual having, for many years, devoted his attention to the study of Orchids and their cultivation, is desirous of imparting to others, whose opportunities may have been less favourable, the results of a pretty wide and varied experience, and, in so doing, it will be his aim to dispel some erroneous impressions in regard to the subject which, if unrefuted, are calculated to diminish the popularity of a most lovely and interesting family of plants, as well as to deter many amateurs from attempting their cultivation, a circumstance to be much regretted, for a delightful recreation is unquestionably lost by those who love their gardens, and attend with pleasure to their greenhouse plants, if the aristocratic Orchid is not included in their collection; its beauty, if equalled, being but rarely surpassed by that of any other plant, so that, once the grower's interest is thoroughly awakened, he becomes so enamoured of his new hobby as to prefer it to all others, however interesting.

It is very important that it should be well understood how successfully Orchids may be grown, side by side, with other stove and greenhouse plants, such as I shall hereafter enumerate; and it is therefore quite unnecessary that the grower should devote his attention to the former alone, there being many greenhouse favourites, at once beautiful in flower and foliage, which he might easily select as fitting associates, and which, under similar treatment, would thrive equally well. Ferns, for instance, are particularly adapted for growing in the same house. Orchids cannot fail

to be a source of the greatest pleasure to the cultivator, who soon finds himself deeply interested in the growth of his plants, irrespectively of their beautiful flowers, and watches, with infinite satisfaction, the development of the fine healthy foliage, the shooting of the tender roots as they appear at the base of the pseudo bulbs and gradually take possession of the compost, or notes the young pseudo bulb as it forms and matures.

Eighteen years' practical experience in Orchid growing has shown me that, when once their nature is thoroughly understood, much less attention than is generally thought necessary is requisite to grow them successfully, their requirements being so simple as to encroach but little on the grower's time. It is quite true that some species still baffle the most experienced cultivators, owing, no doubt, to an imperfect knowledge of the climatic and natural conditions they enjoy in their native habitat; but, as these varieties are somewhat difficult to grow, I shall not recommend them to the amateur's consideration until he has gained more experience; for, as a rule, such sorts are less beautiful than others of easy growth, and can, therefore, be dispensed with. When the necessary culture of a genus or species becomes generally known, the ease and simplicity of its cultivation are speedily made manifest to the inexperienced amateur, thus leading to its more extended culture and that better appreciation which it so richly deserves. I am anxious, both for the sake of our Orchids, as well as for the benefit of those who may wish to attempt their cultivation, to point out that there is absolutely no difficulty, but what may easily be overcome, as soon as an ordinary knowledge of their requirements has been acquired. And, in order to assist amateurs, I shall do my best to give them such practical information as will materially aid them, provided the instructions I now write for their guidance are carefully perused and strictly followed. Why are Orchids generally supposed to be an expensive luxury and out of the reach of all save the most wealthy? I think these notions have arisen from the fact that when Orchids are written about in newspapers and periodicals they are invariably associated with the name of some well-known and wealthy individual as their possessor, which leads many persons to regard them as the exclusive property of a privileged few, and consequently invests them with such a degree of costliness as to make them entirely inaccessible to the humbler amateur. There are, I am pleased to be able to say, in

answer to this, many collections of Orchids now in existence throughout the country, some of them very extensive, and containing rare and expensive sorts, owned by gentlemen with only a local reputation as business or public men; while a large number of amateurs, possessing only a greenhouse or two, are forming collections of a less pretentious character, commencing, under good advice, with easily cultivated sorts. This is most gratifying to Orchidists, and I venture to hope that this little guide book will induce many others to take up Orchids, as I feel confident that the great beauty of their flowers, as well as their lasting qualities, will amply repay any anxiety or trouble bestowed upon them.

Referring for a moment to a somewhat general impression that Orchids are difficult to manage, I must confess that there are some which are not easy to cultivate, or rather to maintain in a healthy flowering condition for many years in succession; yet, there is nothing very extraordinary in this, as the same difficulty presents itself in regard to other plants. But it is not to those plants which are difficult to manage that I shall now devote attention, there being so large a field of species and varieties of easy culture to choose from. No one therefore need be disheartened if unsuccessful in the first attempt, merely because he may occasionally see some Orchids in a very unhealthy condition, even in gardens of considerable pretensions, where, owing to the gardener's want of knowledge of this particular class of plant, arising very often from no fault of his own, but from the fact that he has previously had no Orchids under his charge, and consequently no opportunity of studying their nature and requirements; although, in some cases, it may be the result of the gardener's insensibility to the necessity of obtaining information on the subject; under such circumstances failure must, of necessity, follow. An impression also exists that Orchids are very expensive. This, however, applies only to very new or extremely rare kinds, many of which are not more beautiful than older sorts that are easily procurable at a moderate price—say a few shillings. It is the Orchid enthusiast who, wishing to add new introductions of supposed merit to his collection, seeks these new and rare kinds as introduced; and it is well that it should be so, otherwise many most valuable sorts would be very rarely seen. There is a very beautiful species of the popular Odontoglossum, named Odont. Alexandræ, which deserves a prominent place in every collection of Cool Orchids, and which is

purchaseable at a very small cost. And it often happens that amongst a quantity of plants of this kind, flowering in this country for the first time, some turn out to be of great value, in consequence of their being recognised as vastly improved varieties; whereas, others, showing no improvement on those already in existence, are, notwithstanding their attractions, classed among those of comparatively little value. I by no means advocate the buying and growing of Orchids as a pecuniary speculation, the enjoyment of their great loveliness being the only consideration; still, the fact remains that the selling value of an Orchid is fixed by the exceptional merit and beauty of its flowers, in size, colour, and form. I have often heard gardeners, who do not understand the treatment of Orchids, declare, as an excuse for avoiding their culture, that these plants deteriorate. This is another erroneous impression which I should like to correct. There can be no manner of doubt that under unskilful and improper treatment, Orchids lose vitality and often die, and this result follows with any other plant under similar conditions; but the same plant taken in hand, if not quite dead, and transferred to a proper temperature, where it is uniformly treated with all that is necessary to infuse life and vigour into it, will sometimes revive and become healthy and strong. When Orchids are improperly treated, or placed in a temperature that does not suit them, they soon dwindle and assume a sickly appearance; but if their natural position in the country whence they came is thoroughly studied, and imitated as nearly as possible, then a gradual addition to their yearly growth is made, and successful culture ensured. And this success is sometimes attained in the near vicinity of smoky towns, and under further unfavourable circumstances, when other plants will barely exist. I have known persons, who professed to have a knowledge of Orchids, persistingly assert, despite all contradiction, that these plants bloom but once in several years; and it is to be regretted that such a wrong idea should prevail, for, under proper management, an established plant will bloom once a year, sometimes twice; that is, supposing the said plant is already of a flowering size; and if it be not so, it should not have been bought, as it causes delay and disappointment to the purchaser, who is naturally anxious to see it in flower. Amateurs should therefore secure strong flowering sized plants to start with, even at a little more cost. Some commence forming a collection of Orchids without having any practical knowledge of

their culture, trusting to their gardener's skill, who may possibly never have grown an Orchid, and consequently know but little about it; thus failure upon failure ensues. It would be far better, in every way, when forming a collection of Orchids, to secure the services of a suitable person with, at least, a moderate knowledge of the plants, who would be willing to improve that knowledge and seek for all the necessary information respecting their treatment. This should be done in the first instance—even if twice the wages of an incompetent man has to be paid in order to accomplish it—for the best kinds of Orchids grow in money value, as well as in size, quite independently of the great pleasure they afford; whereas, if improperly treated, they will probably disappear altogether. So many instances of miserable misadventure are met with, as the outcome of improper advice, that I have long felt that practical and reliable information at the beginning would lead to much more satisfactory results, hence the publication of this little Guide Book.

I purpose, in plain words, giving easily understood instructions on important points belonging to every-day work which have to be kept well in view. One important point to be considered being what convenience already exists for growing these plants without building a house expressly for them; also, if the existing structure was intended either for a warm temperature or as a cool greenhouse; if in a light open position or a shaded one, and what heat can be relied upon in very cold weather. It will then be necessary to ascertain what Orchids are most suitable and likely to flourish there without giving much trouble, or demanding more attention than other plants which are well grown. I will now endeavour to explain the difference in temperature of the Cool, the Intermediate, and the Warm house of a higher temperature, in order that learners may form an idea as to what class of Orchids are adapted for their houses, and to enable them the better to understand the growth and requirements of the plants under their care.

Formerly it was thought necessary, in order to cultivate Orchids, that some special structure should be built for them; but years of experience have proved that a disused vinery, or an ordinary greenhouse where a general collection of plants is grown, will suit Orchids equally well, provided they are properly attended to. Of course, as previously stated, it is necessary, before making

a purchase, to consider to what different species of Orchids the house is best adapted; for instance, the degree of heat at command, and the amount of light or shade afforded, must be taken into account, and I will endeavour to explain this fully. I do not recommend the cultivation of Orchids with fruit trees in the same house, although it can be done, and sometimes successfully, by those who fully understand their requirements, during the various stages of growth, but, unless in very experienced hands, such treatment would most probably end in failure, and I am desirous of bringing about an opposite state of affairs. Many of the most beautiful species of Cool and Intermediate Orchids will, as before remarked, grow with other plants, provided the conditions of the atmosphere and temperature are suitable. I am aware that many amateurs, especially those living in towns, labour under a difficulty, owing to the limited area of their glass structures, which are sometimes placed in unfavourable positions, although some of these may be suitable for a restricted class of plants. It is not unusual to see a glass structure resembling (Fig. 1) a lean-to house,

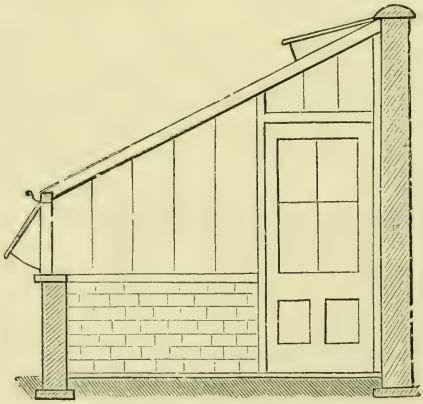


FIG. 1.

against the dwelling-house or a garden wall, having an east or west aspect, and where Orchids, requiring the treatment of an intermediate house, can be grown, as well as many stove (warm-house) Orchids. If such a lean-to house has either a north, north-east, or north-west aspect, Cool Orchids will flourish; but it

is not possible to grow Cool-house Orchids in a lean-to house facing the south, unless it be shaded from the sun by tall trees. If, however, the house should be span-roofed, as in Fig. 2, and

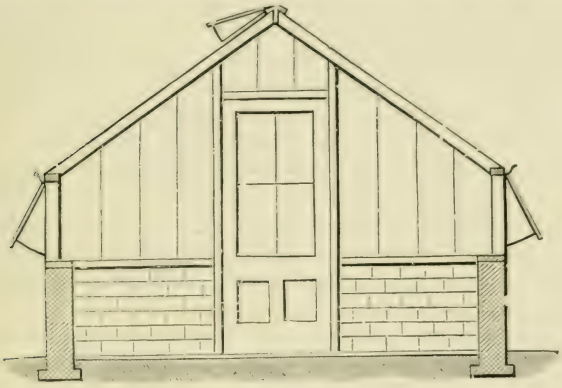


FIG. 2.

standing in an open situation, then it would be suitable for all species of Orchids, either Cool, Intermediate, or Warm-house, as well as those loving sunshine or thriving best in the shade. In such a house the atmosphere, temperature, and other conditions, could be regulated as desired, by the aid of shading, ventilation, &c. If, on the other hand, this house should be naturally shaded by the growth of trees or tall buildings, it would be suitable only for Orchids loving shade, and require the use of roller blinds only when the sun acts directly upon the house. Having decided as to what plants the houses are best adapted, the next point will be how to buy the plants, and although this may, at first sight, appear to be an easy matter, it is nevertheless an important one, as success or disappointment depends very much upon the health and strength of the plant when purchased. Amateurs, therefore, should be very cautious in making their purchases, especially at first, for they are too often at the mercy of those who sell—some of whom are not over scrupulous in what they sell to beginners—so that those about to purchase will act wisely in consulting some experienced cultivator of Orchids, or, at all events, some person who understands them, and really knows whether a plant is healthy or not, and what its approximate value may be. Then the buyer

has some chance of success with the plants, selected to suit his greenhouse, and other conditions of culture, and he will naturally look forward to the pleasure they will afford him when in bloom. But as such advice is not always within the reach of those who need it, I shall do my best to supply that want and make my meaning as clear as possible. There is one word of caution which I here desire to impress upon buyers, and that is, do not on any account buy rubbish, merely for the sake of saying, "I grow Orchids!" and by no means be tempted to purchase small, insignificant plants simply because they are cheap. Orchids are slow growing plants and require special care and attention, as well as the most judicious treatment, and if small and weakly bits of back pseudo bulbs, or weak spindling plants are bought, much time is lost before they can be got into a favourable condition, and a considerable period elapses before they reach the flowering stage, so that the patience of the grower becomes exhausted, and the plants are either allowed to linger on, or are thrown away. Overcrowding is another evil to be avoided, and when large quantities are grown in limited spaces, it is one of the greatest difficulties an Orchid cultivator has to contend with. Each plant should be accessible and easily seen by the cultivator at all times, but more especially during the growing season, in order that he may ascertain whether it requires water, or is not overwatered, and to see that the young roots are unmolested or destroyed by various insect pests, such as wood lice, cockroaches, slugs, &c., and that the foliage is free from thrip or green or yellow fly. In a large collection, where plants are counted by the thousand, and a good staff of assistants are kept, it is, even then, difficult to give every plant necessary attention, so that the small grower has here an advantage in being able to give full attention to the few plants under his care.

CATTLEYAS AND LÆLIAS.

Presuming that, in the formation of a small collection, Cattleyas should have the first place, procuring Trianæ, Mossiæ, and Mendellii in their varieties, also labiata vera, and good plants of these, with a leading growth, can readily be obtained at 4/- each, and with two leading growths at 7/6 each, the price varying according to the strength of the plant and the excellence of the variety. I advise amateurs to start with such plants rather than

those with a larger number of leading shoots, as they are more easily managed. Fig. 3 (*see page* 11) represents a newly imported plant showing the leading pseudo bulb and the back pseudo bulbs. Fig. 4 (*see page* 17) shows a semi-established plant with two leading growths and back pseudo bulbs. The back bulbs, after flowering, are of no further use for blooming again, but serve as reservoirs for the plants, by storing up nutriment during the summer or growing season for the use of the plant during its blooming period, so that the old pseudo bulbs, apparently of no use to the inexperienced in Orchid culture, are still a part of the plant and continue for years to render assistance to it. I have, however, invariably found that they are of very little use after the fifth year, and when the plants are repotted they may be removed from their position, but not thrown away, so as to enable any dormant eyes to push into other leading growths. In the case of Oncidiums or Odontoglossums, the old pseudo bulbs should remain until they turn yellow and die. In buying plants of Cattleyas, the last fully-developed bulbs should be supported by at least three or four back ones, to give strength and nourishment to the new growth. I have quoted prices as a guide to beginners as to what class of plants to buy, these prices being generally considered to be fair to the buyer and seller; although, when imported plants arrive in good condition, they may sometimes be purchased from the importer or at auction sales at a lower price.

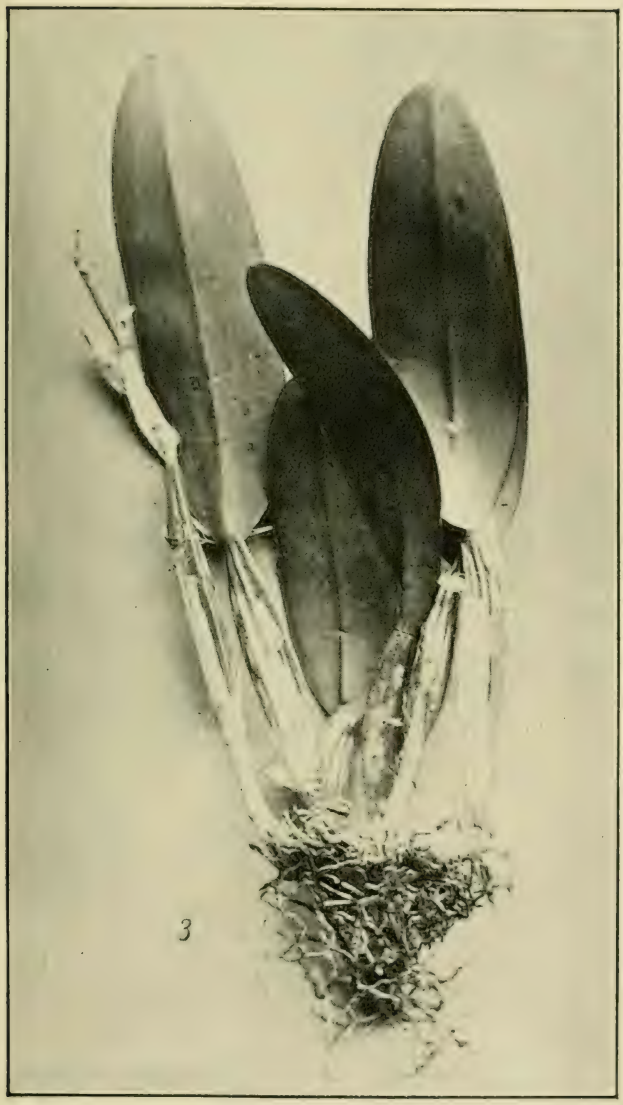
DENDROBIUMS.

In buying such useful and beautiful species of Dendrobiums as nobile, Wardianum, and others, prices vary as in Cattleyas, and are ruled by the quantity of plants coming forward. D. nobile is one of the oldest species, and yet one of the very best and easiest grown, and it is so very floriferous. It is, however, advisable to buy established plants, as it is always cheap, and blooms are formed on the previous year's growth. It often happens that the old growths on imported plants become injured to some extent in transit, which prevents their flowering well, and two years will elapse before much bloom can be expected. Nearly all other Dendrobiums, which are not garden hybrids, may be purchased either newly imported or as established plants, but in the case of D. Wardianum, D. crassinode, and D. Devonianum, it is decidedly

advantageous to buy strong newly imported or semi-established plants, carefully selecting those in a fine healthy condition. Fig. 5 (*see page* 25) represents an established plant, in a 5-inch pot, of D. nobile, having four leads, 5/- being a fair value of such a plant. Fig. 6 (*see page* 31) represents an imported plant of D. Wardianum, with two leads, and should be bought for 4/- In buying Dendrobiums they should have two or three pseudo bulbs disconnected at the rhizome, in addition to the one last made, each pseudo bulb counting as one leading growth. Dendrobiums do not really depend upon the old pseudo bulbs from which to draw nourishment so much as some Orchids, they may therefore be cut away from the base of the plant if it is advisable to propagate and increase the variety (*see* Notes on Propagation, *page* 39), leaving four pseudo bulbs to feed the forthcoming growth.

ODONTOGLOSSUMS AND ONCIDIUMS.

These lovely and interesting genera of Orchids are general favourites, owing no doubt to the fact that, in addition to their beauty, the greater part of them can be grown successfully under cool treatment, and on that account are not so expensive to cultivate as those requiring more warmth. A large collection of these charming and useful Orchids could be got together, all of which would flourish under exactly the same conditions, and thus one house would, if properly managed, furnish the year round a good supply of the most lovely flowers imaginable. The great beauty and exceptionally meritorious character each individual species possesses, would fill volumes if full justice were done them. I propose to say but little in this direction, as it is a subject really of no aid to cultivation. I omit, likewise, that long botanical description of pseudo bulbs, foliage, and flowers, which tend rather to confuse than to assist the beginner. In these days the general beauty and interesting character of Orchids are freely written about in various books and magazines, independently of the gardening press, but to read of the special qualities of a flower is one thing, and to grow that flower is another; therefore, I devote my space chiefly to cultural directions, so that amateurs may be in a position to produce the flowers and see for themselves. Most of these cool growing Odontoglossums and Oncidiums are very cheap and exceedingly beautiful. Odont. Alexandræ and Odont. Pescatorei,


3

being two of the very best, should occupy a prominent position in every collection. These and other popular varieties may be purchased as strong imported or established plants; but by buying the latter in a healthy condition much time is gained, as the imported ones are slow in becoming established, and the others are purchaseable at almost any reasonable price; good plants of ordinary varieties selling at from 2/6 to 3/6 each, while as much as 50 guineas has sometimes been paid for a plant of an exceptionally fine or rare variety. It is best, therefore, to pay a reasonable price and start well with good plants. Fig. 7 represents an imported plant of Odont. Alexandræ, a fair value being about 3/- to 5/-. Fig. 8 represents a semi-established plant, obtainable at a cost of from 5/- to 7/6. Odont. crispum, *syn.* Odont. Alexandræ, is a universal favourite, and is imported in very large numbers, finding a ready sale; but these, if strong and healthy, can seldom be purchased at lower prices than I have named.

CYPRIPEDIUMS (*The Lady's Slipper*).

These are Orchids having no pseudo bulbs, and on that account are somewhat difficult to import and establish, but when successfully done they generally admit of easy culture. It is, however, best under all circumstances to procure established plants, and although very far from possessing the beauty and attractiveness of a Cattleya or a Dendrobe, still there is a great deal of beauty in them all—some much more than in others—and all are most interesting and of comparatively easy culture. The most common, and one of the oldest and the freest growing of all, is C. insigne, still ranking as one of the best, good plants of which, in 5-inch pots, represented by Fig. 9, capable of bearing five or six flowers, can be purchased at from 5/- to 7/6. There are many varieties of C. insigne, more or less expensive, according to the quality of the variety, but the typical form is handsome, and can be grown so easily. Perhaps the most interesting and distinct form of C. insigne is to be found in C. insigne, *var.* Sanderæ, in which white and clear yellow colours predominate (this was purchased by Baron Schroeder for a large sum, and is now in his very fine collection). There are many other species and varieties of Cypripediums, nice plants of which may be secured at prices varying from 5/- to 20/-, whilst other rare species and hybrids are

expensive. Cypripediums have now for several years held a prominent position and are established favourites; the diversity in colour of the various kinds, the interesting formation of their flowers, and their easy culture, having done so much to secure this popularity. There are now an extraordinary number of varieties of many species, it being quite easy by fertilisation to obtain seed and seedlings; and, in the hands of our hybridists, new forms, some of them of great beauty and distinctness, are yearly being added.

MASDEVALLIAS.

I now wish to say a few words about this very interesting family of epiphytal Orchids. This genus was named in honour of Dr. Masdeville, and is a very large one, there being upwards of 150 known species. Comparatively few species, however, merit cultivation for their beauty alone, although all are extremely interesting; and in forming a collection of them, many wonderfully quaint and curious forms and colours will be found, some of the tints being very peculiar. Masdevallias are cool growing Orchids, and as many of them are of a very close, compact habit, they only require to be accommodated in small pans or in baskets suspended from the roof; therefore a large collection can be grown in a small space. A house which is in a sheltered position, both from strong winds and from the strong rays of the summer sun, suits them best, as then, a moist and regular temperature and atmosphere can be evenly balanced, such as is congenial to this genus. They grow freely if potted in equal parts of sphagnum moss and peat, with a little coarse sand mixed in to keep the compost porous and sweet; for strong growing kinds a little fibrous loam may be mixed in with advantage, and they should be given a position in the house not too far from the glass roof. Masdevallias under wrong treatment, such as over-indulgence in watering, being kept too dry, or when subjected to extreme heat or cold, refuse to make much headway—their leaves drop, the plant decays, and, having no pseudo bulbs, they quickly disappear; but, on the other hand, they are very easily cultivated, if the house and treatment suits them. Such species as Harryana, Veitchi, and other similar strong growing kinds, are best grown in pots. The pots should be crocked for drainage to one-half their depth and the plants made moderately firm in the compost, as already indicated,

using pots sufficiently large for the plants, and allowing an inch from the leading growth to the rim of the pot. In potting, the plants need not be elevated very high above the rim, or trouble may be experienced in making the plant secure, which must be done; otherwise, if left in a loose and unstable condition, the plants are unable to become quickly re-established and consequently dwindle. Small neat sticks should be used for this purpose, to keep the plants firmly in their places until they become self-supporting masses. The compost, after repotting, should be carefully watered, keeping it just moist only until the new roots appear and get hold of the compost, then more water may be given. Drought at the roots is not conducive to good growth, but it is safer to err on that side than to give too much water. The temperature really most suitable for a collection of Masdevallias is one a few degrees higher than that advised, later on, for the Odontoglossum house.

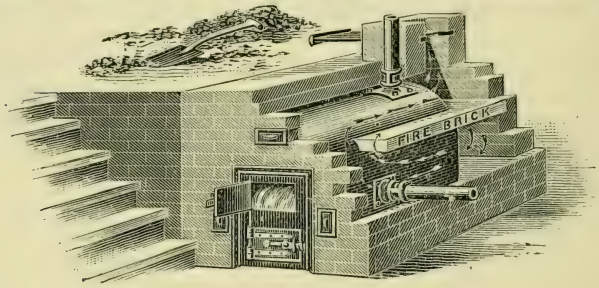
The species, M. Harryana, is named after Mr. Harry Veitch, the head of the great Chelsea firm of nurserymen, and the varieties of this species are very numerous and beautiful, and a great diversity of colour exists. There is in existence, a pure white form, and the darkest colour known is the Bull's Blood variety, while M. Harryana armenaca is a lovely orange colour; such varieties as these are very expensive, but the typical forms are very cheap.

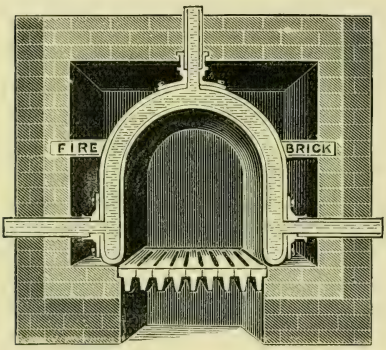
The time of flowering for Masdevallias is generally from March to July, but a few are to be had in bloom the whole year round, the repotting period being from July to September.

ARTIFICIAL HEATING.

Heating by hot water is a most important matter, and, of course, the more perfect the arrangements the better can the desired degree of warmth be maintained. When this work is entrusted to a hot-water engineer, it is usually properly fitted and left in good working order; but it sometimes happens that when a house is to be used for a class of plants it was not built for, and there is a probability that there may be an insufficiency of warmth, it becomes necessary to examine the heating power of the boiler and pipes in order to find out the defects in any part. Many kinds of boilers are in use; but whatever description of boiler may be decided upon, care should be taken that it is of sufficient size to heat whatever length of piping is attached to it, so that in hard

weather plenty of heat may be readily obtained to ensure a regular and perfect temperature without inducing strain or undue pressure upon the boiler. Such a boiler as shown is one that





can always be relied upon. In the event of making any alteration in an existing house, or building new houses, it is well to have more hot-water pipes fixed than are actually sufficient, rather than not enough. For instance, a more genial growing temperature is generated from, say, four pipes made slightly warm, than from two pipes, which would probably have to be made very hot, and so give off dry, fiery heat. When there is more than one house heated from the same boiler, it is best to have sufficient valves, so that the hot water can be turned on to one house only, or to others also, as may be required.

For the Cool Orchid house there must be sufficient heat at command to maintain during severe weather a night temperature averaging 45 degrees. For an Intermediate house there should be



enough to keep up a night temperature of 55 degrees; whilst the temperature of the Warm house should not be allowed to fall below 60 degrees for any length of time.

STOKING THE FIRES.

As it is warmth from the pipes which creates the artificial temperature in the greenhouse, and as Orchids are plants which sustain themselves chiefly on air, it is quite evident that the better the artificial air is produced and maintained the better it is for the Orchids, as well as for other plants growing with them. Stoking, then, is an important matter, and such work should be done by an intelligent man and not left to any odd hand, as is too often the case. There is art even in stoking a greenhouse fire, and the person who is in charge of the fires should understand the thermometer, and be one who can be relied upon to give careful attention to his duties, letting the conditions of the weather outside guide him. Let us suppose, for instance, that it is a very dull and cold day in January, when the fires require to be well stoked, keeping them clear and bright, as can be done with anthracite coal or coke, at such a time more heat will be necessary during the day than at night, in order to give a rise of a few degrees in the temperature. This is an instance when careful stoking and watchfulness of the thermometer crops up. Then suppose a day in March or April, clear and bright but very cold, necessitating good firing during the night to keep up a proper temperature, but with the sun shining brightly in the daytime, a much reduced amount of fire only would be wanted. The fire could then be "damped down" with slack (small coal) until two or three o'clock in the afternoon, when it should be started again, first clearing out the furnace bars and firehole. In the hot summer days of June to August it is possible that fires may be dispensed with, even in the stove house, but still a cold day or night may come, when a little fire to warm the pipes and raise the temperature a few degrees would be advantageous. Again, in November, one day may be very cold, requiring brisk fires to keep the proper temperature, whereas, the following day may be damp and close, needing but little warmth in the pipes, enough only to assist ventilation and to admit of the ventilators being opened. See, then, that the fire is managed carefully, always maintaining an even temperature, avoiding the extremes of overheating and dryness, or damp and cold.

VENTILATION.

This is another most important matter requiring the attention of some one having a fair amount of intelligence, for Orchids are plants that live, thrive, and grow robust on the air, and the moisture it contains, therefore, it is absolutely necessary that they should have as much air as possible without causing a draught, or sudden rising or falling of the thermometer, as this would be injurious. Every plant house should have ventilators to open and close, both at the bottom and top of the building. Those at the bottom should be in the wall, on a level with the hot-water pipes, and the top ventilators should be at the highest point of the house, while the opening and closing of these ventilators require as much care as the stoking. The person in charge must be guided entirely by the condition of the weather, as two successive days at any season of the year may demand a difference in management. One summer day may be warm and the wind calm and the houses shaded from the fierce rays of the sun, and the ventilators opened more or less on all sides in order to secure perfect ventilation; the following day it may still be bright, and necessary for the roller blind to be let down, with cold and drying wind blowing rather strongly from, say, the west, in which case the ventilators facing the west must be kept almost closed, perhaps quite so, whilst those on the east side can be opened as required. A well ventilated, moist growing temperature could thus be secured, but not so if the ventilators were open on the windward side, with a direct draught of cold arid air on the plants, which would cause them to suffer. A careful system of ventilation should therefore be observed at all periods of the year, but the autumn months admit of a greater amount of air and ventilation than at any other season, as it is at this period that many Orchids have finished their growth and require to be "harvested," as it were, by gradually reducing the amount of moisture both in the atmosphere and at the roots, and this is easily accomplished by ventilating more freely; but in changeable weather discretion must be used in giving air, as at other seasons, bearing in mind, however, that when the growth is finished they are decidedly more hardy, and are capable of withstanding a larger amount of air than at any other period.

During the winter months air should be admitted at all times

when the outside conditions of the atmosphere permit. But it often happens that it is necessary to shut the houses up as closely as is possible, especially in exposed situations, in order to keep the thermometer registering the desired degree of heat; but when it can be done, admit air through the bottom ventilators in a very small degree, increasing it if the weather becomes more favourable. In very mild weather the top ventilators may be opened on the leeward side.

The utmost attention to ventilation is required during the spring months, as the plants are then in a somewhat tender and delicate state, having passed through the winter, when, no matter how much care may have been exercised as to heat and ventilation, they are of necessity deprived of much air, having been kept in a close temperature, and are therefore more susceptible of a check at this season than at any other period. It is then we often get bright sunshine accompanied by a cold east wind, when it is a mistake to open the ventilators, as many do, to keep down the temperature. Instead of doing this let down the roller blind early, so that the temperature may not get too heated, and a little air through the crevices, which invariably exist, will be found sufficient.

SHADING.

Shading the house at all times, when necessary, is another subject to which I must draw attention, as some Orchids do best in the shade, many prefer partial shade, whilst others, in their native state, luxuriate in the full blaze of the sun, but, when under glass, there are few plants that will withstand its full power during the summer months without some protection in the way of shading. Although most Orchids require as much light as can be given to them, exclusive of the scorching rays of the sun, it is best to use roller blinds that can be let down in sunny weather and rolled up during cloudy periods or when the heat of the day is past. One of the best systems of shading is that marked D and E on illustration of greenhouse. A framework of wood or iron is fixed upon the roof of the house, merely for the roller to rest upon. This framework should be about eight inches from the glass, so as to admit air and keep the house cooler than if the shading rested on the sash bars, an important point with Cool Orchids, especially during the summer. The blinds can be easily arranged to roll up and down, by means of a cord and a simple apparatus,

which any carpenter can fix. These roller blinds should be affixed by the end of February, so as to be ready for use when wanted, for it is frequently found that, without such shading, bright sunshine will do much damage early in the spring, even to plants which are able to stand the full blaze of the sun in summer, and that is brought about by the plant having passed through months of dull weather,—perhaps with weeks almost sunless—and, being in consequence in a less hardy state than usual, are unable to bear a sudden burst of sunshine of a few hours' duration; then, if shading is neglected, the foliage gets burnt and damaged, checking growth and giving an unsightly appearance to the plants; it is therefore most important that after a long spell of dull weather the plants should be gradually accustomed to stronger light and sunshine. The roller blind system of shading is far better than colouring the glass with whitewash or other similar preparation, which keeps the house too dark in dull weather for the wellbeing of the plants, whilst, in bright weather, the temperature of the house is likely to get much too hot and dry, bringing on the propagation of various insect pests. The sides and ends of the house may be permanently shaded by colouring matter through the summer, but this should be washed off again in September.

Various materials may be used for blinds, but there is one manufactured for the purpose, which can be purchased of our leading nursery and seedsmen; this is made of various textures, the thicker material suitable for shading Cool-house Orchids, and the thinner for plants requiring less shading. The blinds should be taken down in the autumn—some of them may be dispensed with at the end of September—and, when quite dry, can be stowed away until the following spring.

Another system of shading, and perhaps for Orchids the best of all, is that shown in Fig. 10 (*see page* 51). This is made of strips of deal, a quarter of an inch thick and an inch wide, and as long as the depth of the roof of the house—they are made in about six feet lengths. Thus a house 18 feet long would require three lengths for one side, and, as these are so easily rolled up, all that is needed is to place them on the wooden framework above the glass, and rolling or unrolling them by the hand as necessary. They are made by tying the strips together with twine, leaving space between each strip of from a quarter to half an inch, as required for the different plants.

THE ATMOSPHERE.

Attention having been given to Stoking, Heating, Ventilation, and Shading, as already advised, much has been done to create a suitable atmosphere for the plants to live upon. Amateurs will do well to see that it is not in any way stuffy or close, as stagnant air is as objectionable and injurious to plants as to human beings. Water is an indispensable factor in producing an atmosphere suitable for Orchids and other plants which grow in company with them, and a good supply should always be at hand. Hard, or tap water, will do for damping the stages, floors, and side walls, in order to produce evaporation; but, for watering the plants, rain water, reservoir, or river water should be used. The atmospheric conditions of the house, of course, varies according to the season of the year, and, whether the plants are in a growing state or at rest, there may be days which are wet and not very cold, when it would not be necessary for the pipes to give out much heat; then, what with the moist air entering the house and but little fire heat to dry it up, the plants being in a dormant state, very little, if any, watering would be requisite on the floor, stages, or the plants. But on days when it may be very cold, necessitating a great amount of heat in the hot-water pipes, then, of course, sufficient water must be used on the floor for the prevention of a harsh and dry atmosphere, but taking care to preserve a proper degree of genial temperature.

As a general rule, during the winter months, damping down the floors and stages once a day is quite sufficient, and that work should be done in the morning; but on some days it is not required at all. In the spring and summer months the atmosphere should be more humid than at any other season, as the plants are then making young growths, and it is at this time that a moist atmosphere is so essential to them to induce strong quick growth. A higher temperature is then also required in the Warm house, and more air being given, greater attention must be paid to the damping of floors, stages, &c. During the growing season it is advisable to thoroughly damp down between the pots, floors, and walks three times a day—morning, noon, and night. This must, however, be regulated by the weather prevailing at the time; for, if dull and damp, it is not necessary to do it so often. The arrival of autumn brings with it a reminder that the plants having made their

season's growth less moisture is needed and may be partially, but gradually, withheld. The season of rest having arrived, it is advisable to encourage an atmosphere that is airy, light, and bright, but not so dry as to cause the plants to shrivel and show a yellow tint. In such an atmosphere the plants will be sustained in health during this period of rest without exciting premature growth, second growths late in the season being very undesirable, for rarely can such plants as Cattleyas and Dendrobiums finish off perfectly such growths, even in a long and fine summer. Evaporating troughs on the hot-water pipes are sometimes adopted to assist in generating moisture.

TEMPERATURE.

As with the atmosphere, so with the temperature of the house, success depends in a great measure upon good careful stoking of the fires. Even where proper arrangements are made for ventilation and shading there is frequently great difficulty in keeping the thermometer exactly at a given degree, for the inside temperature being affected by that prevailing outside, great care has to be exercised in order to avoid extremes of heat or cold. For instance, if a house should by accident get much below the necessary temperature, do not force the fire at a rapid rate in order to immediately restore the heat, but when the weather is very cold cover the house with garden mats or other material, letting the fire start gently, and the temperature rise slowly to the proper degree. On the other hand, should the temperature, through neglect of ventilation or some other cause, rise to a height out of proportion to what is requisite, as it often will, most rapidly, when shading and ventilation in hot weather is not properly seen to, then do not open the doors and ventilators widely, but at once run down the roller blinds and open the ventilators gradually, in order that the temperature may be brought down to the degree of heat required. Good management and care will however prevent such accidents, and a wise grower will not allow valuable plants to run the risk of injury from such a cause. It is no uncommon occurrence to see two healthy specimens of an Orchid, standing side by side, one wet at the roots, the other perfectly dry. The sudden and rapid fall in temperature would most likely injure the plant with wet surroundings, whilst that with its roots quite dry would suffer more from extreme



heat, and yet the conditions of these plants at the time of injury may have been overlooked and some other reason assigned for the cause. Temperature and atmosphere must therefore go hand in hand, and with the judicious application of fire, or sun heat, with air and moisture, a suitable temperature for all seasons can easily be obtained. Just a word or two as to a general rule. Avoid an internal muggy atmosphere in close gloomy weather, and a fiery dry temperature in cold weather, or excessive heat or cold at all times.

The following tables are given as a guide to amateurs in securing the necessary temperature for Cool Orchids, Intermediate-house Orchids, and Warm or Hothouse Orchids, the degrees given being an average desideratum; a little variation either way may be allowed, without in any way injuring the plants:—

COOL HOUSE.

	Day with Sun.	Day without Sun.	Night.	Morning.
Winter	58	53	50	45
Spring.....	63	60	55	50
Summer	As low as possible.	65	60	55
Autumn.....	63	60	55	50

INTERMEDIATE HOUSE.

	Day with Sun	Day without Sun.	Night.	Morning.
Winter	65	58 to 60	58	53
Spring.....	70	65	63	58
Summer.....	75 to 80	73	65	60
Autumn.....	70	65	60	55

WARM HOUSE.

	Day with Sun.	Day without Sun.	Night.	Morning.
Winter	70	65	63	60
Spring.....	80	70	68	63
Summer.....	80 to 90	78	75	68 to 70
Autumn.....	75 to 85	70 to 75	70	65 to 70

POTTING AND BASKETING.

It is essential that this work should be most carefully done. The best compost in which to grow Orchids is the very best fibrous Orchid peat and sphagnum moss in about equal proportions, adding about one and a-half gallons of broken charcoal to two bushels of sphagnum and peat—the latter should be broken into pieces about the size of a hen's egg by the fingers, and if the moss is long it should be chopped once or twice. This forms the best compost known for the majority of Orchids, although many varieties require more peat than sphagnum, and in some cases a little sweet fibrous loam may be added to advantage. Having prepared and mixed the compost, the plant, if an established one, should be turned out of the pot and every particle of crock and old material cleaned away from the roots, bearing in mind that it is a very bad practice to insert the old ball of roots into a new pot, as is customary with other plants, such as ferns, &c. The removal of the old compost and crocks is best accomplished by means of a pointed stick; all dead roots, pseudo bulbs, or old stems useless to the plant, having been carefully cut away, a clean pot should be close at hand, and of the right size, to receive the plant. In repotting Orchids it is not always necessary to give them a larger pot, as one of the same size as that in which it has been grown often suits it better. It is a great mistake to overpot Orchids. A good idea of the size required can be gained by selecting one large enough for the plant when two more growths are added to the leading pseudo bulbs before reaching the side of the pot. The roots of Orchids should not be unduly disturbed, provided the plants have been recently potted and in good material, as many may remain two, or even three years, without disturbance, needing only top dressings and the renewal of supporting sticks. When, however, repotting is necessary, and that is when the compost becomes too much decayed and in a sour condition, or the leading pseudo bulbs are growing over the rim of the pot, or from any other cause, then the repotting should be done carefully and well. Supposing, for instance, we are about to repot Cattleyas. In the first place, take the plant out of the old pot as carefully as possible, clearing away all worn out soil, &c., as already directed; avoid, if possible, breaking any roots, and have a clean pot ready, about half full of clean broken crocks and small lumps of charcoal, to form effective drainage, so that water

can pass through most freely and escape through the hole at the bottom of the pot. A thin layer of sphagnum should be laid over the crocks and charcoal, then place the plant in position, holding it there with one hand, and with the other distributing the roots in the pot, afterwards filling in with the compost, and whilst still holding the plant firmly with one hand, the peat, sphagnum, &c., should be carefully packed in, neither too firmly or too loosely, but well into the centre between the roots, so that no hollow spaces are left. A little practice and careful use of the fingers will soon enable beginners to pot their plants properly. The plant will then be self-supporting, with the exception perhaps of a few neat sticks thrust into the compost gently, so as not to injure any roots but yet support the plant securely, and prevent injury to the pseudo bulbs and young growth. As soon as the plant is made secure by the support of sticks, then carefully finish off the potting, by filling up any holes or loose places, leaving an even regular surface, with the centre of the plant a little raised and tapering off to the rim of the pot, bearing in mind that the compost should go well up to the base of the pseudo bulbs, especially the leading ones, newly forming roots will then push out direct into the fresh compost; and having grown safely into the moss they are out of the way of their enemies, the slugs and other pests, which are very partial to the young and tender points. In repotting, the opportunity should be embraced of forming a neat and well shaped plant; and if ill shaped, it should be cut in two and rearranged into a better form, with the growths pointing towards the centre.

Fig. 11 (*see page* 57) represents a newly potted plant of Cattleya, showing position of drainage and compost.

ODONTOGLOSSUMS AND ONCIDIUMS.

The mode of potting these is very similar to that already described for Cattleyas, as to drainage, compost, and other items, although Odontoglossums and Oncidiums are not quite so sensitive as to the fibrous nature of peat; therefore the best, and that which is of the most fibrous texture, should be selected for the Cattleyas. Neither should over large pots be used for Odontoglossums, as they become re-established much quicker, and are more readily managed, in comparatively small pots. I do not, of course, recommend cramming the plants in so that they are in a cramped state to

commence with and have not sufficient room to grow. What I mean is, that the old pseudo bulbs should be placed close together, filling in between them with compost to the base, allowing a margin between the leading pseudo bulbs and the rim of the pot sufficient for the development of the next two years' growth; that is, two new bulbs before the side is reached. These should also be made firm in their pots by the use of small sticks.

CYPRIPEDIUMS.

These plants very soon recover from any disturbance of the roots, and are very free growing. They require a compost with a little more body in it, and of a richer nature than that previously recommended for Odontoglossums; it should consist of equal parts lumpy peat, not of such a fibrous nature as for Cattleyas, adding sphagnum and a fourth part of fibrous loam broken into small pieces; also another fourth of half-rotted leaf-mould with the finer portions sifted out of it. This, with a liberal addition of coarse silver or river sand, should be well mixed together. The pots should be crocked, as recommended for Cattleyas, with a thin layer of sphagnum over the drainage. All the old soil, &c., must be removed from the roots, the plants held in position and filled in between the roots, as before advised, taking care not to injure the roots, or packing too hard or too loosely; it is advisable to have the plant just above the rim of the pot. Cypripediums grow rather luxuriantly, and should therefore have reasonably large pots in proportion to the size of the plants and the quantity of roots.

DENDROBIUMS.

These must be potted in the very best fibrous peat and sphagnum, in equal proportions, preparing both as recommended for Cattleyas, and the pots should be thoroughly drained in the same way. As a rule, Dendrobiums do far better in small pots than large ones; in fact, some kinds are most sensitive in this respect, a large mass of material about the roots being most distasteful to them. Many of the Dendrobiums really thrive better when planted in teakwood baskets or earthen pans and suspended from the roof; still there are some kinds which it is necessary to grow in pots, because of the great length of their pseudo bulbs. Fig. 12 (*see page* 69) illustrates the method of growing them in baskets or



pans. There are, however, exceptions, as in D. Falconeri, one of the most beautiful of all, and a comparatively fragile grower. This variety is most successfully cultivated on a teakwood raft, or, what is still better, a portion of the stem of a tree fern. D. aggregatum majus must also be grown on a block.

TIME OF REPOTTING.

The proper time for carrying out this work can scarcely be disregarded, and it should be made a practice to do all that is required in this respect immediately after their season of flowering, for it is then that Orchids commence growing and pushing new roots, which readily take hold of the new soil. There are, however, a few exceptions to this rule to be found in the autumn-flowering species, notably Oncidiums, Vandas, Odontoglossum grande and its allied varieties, Pleiones, and Thunias, which should not be disturbed until repotted in the spring. Cattleya gigas, aurea, and Warnerii are also late summer and autumn-flowering kinds, but these I prefer repotting directly after they have flowered, although they may be left until the early spring, when this operation can be performed with success. Cattleya labiata (*syn.* Warocqueana), Bowringiana, and marginata also flower late in the autumn, and, like all other late-flowering sorts, are best left over until spring, as during the dark days of winter but little root action takes place, and it is far better to leave the repotting until young roots are ready to start into the new compost. The Cool-house Odontoglossums I repot in September, but it is best to attend to each as they go out of flower and directly the new growth is seen pushing from the base of the last made pseudo bulbs.

POTS AND BASKETS VERSUS BLOCKS.

Do not be persuaded to attempt growing Orchids on blocks of wood, thinking that by so doing their natural habit will be more closely imitated, for it invariably ends in failure, and there is no exception to this rule. They cannot, in our artificially heated glass houses, be grown successfully for any length of time on blocks of wood or lumps of stone, as they are known to do in their native habitats, where they flourish in full vigour and beauty. This may appear to be a strange dogma to the inexperienced in growing Orchids, but it is nevertheless a fact.

I grant that a newly imported healthy plant of Cattleya or Dendrobium, if wired to a block of wood or cork, will grow well for a year, or perhaps two, but after that the plant is found to dwindle away and become less by degrees. The reason why Orchids fail with us, when trying to grow them in the manner in which they luxuriate in their native countries, is obvious, when we take into consideration how utterly impossible it is for us, even in the largest and most perfectly regulated establishments, to create in an enclosed space of a few square yards, which has to be heated artificially for more or less of nine months of the year, that admirable, fresh, buoyant, and uniform atmosphere which exists amongst their native mountains and in their forests and dells. We may sometimes, during favourable weather and proper management, partly succeed in doing this, but perhaps in the next hour, with lax attention and a totally different temperature, there will be a greatly altered state of affairs. This varying and ever changing artificial atmosphere—sometimes laden with moisture, at others dry and harsh, with the temperature changing quickly from hot to cold—undoubtedly occurs in a larger or smaller degree in every establishment, and this is the chief reason why an Orchid does not grow satisfactorily if all its roots are exposed to these sudden and recurring changeable conditions, although it is natural for them to perform their proper functions when exposed in their native habitats. It is, therefore, necessary, when under culture, that the roots should have protection from these sudden changes of temperature, and this is best done by growing them in pots or baskets, in a suitable compost, as they thus escape the ill effects of root exposure and can be kept in a more regular condition of moisture, not saturated one day and extremely dry the next, as is the case when they are fastened to blocks of wood. There is also another reason, which I have no doubt has much to do with this failure on blocks, which is, that with us the blocks of wood have no life in them and contain no moisture whatever, whilst in their native countries many of the Orchids grow on living trees. I think it is a very rare experience with collectors abroad to find them growing on trees which have been dead any considerable time.

There is a beautiful old Orchid, Cattleya citrina, which from its peculiar drooping habit of growth cannot well be grown in any way but on blocks. Even if planted in a basket or

pan in an upright position, the new growth will invariably turn downwards and creep over the sides. Some cultivators place these plants in small pans or baskets, making them firm with peat and sphagnum moss, so as to allow them full freedom of growth over the sides, and I have no doubt they last longer in a good healthy condition this way than any other, although it lasts for a considerable time in health on a block when well attended to. It is sometimes interesting to show visitors a plant growing on wood, and this Cattleya is the one I recommend to be grown for the purpose, but the block should be cut in a green state and of the desired length, leaving the bark for the roots to cling to. The wood of the pear tree, apple tree, or of the dogwood (Cornus) is the best; and I remember once placing some plants of Oncidium papilio (the Butterfly Orchid) on a block of dogwood, cut from a growing tree, sufficiently long for one end to be fixed firmly in a flower pot in an upright position, with crocks and sphagnum moss about it. The plants were placed close together on the top part of the block, completely away from the sphagnum, and the moisture from the latter kept the block quite green for a considerable time; during the first year it made a new layer of bark, and I never saw plants of Oncidium papilio grow better under any conditions, the new bulbs and leaves were so strong, and the roots climbed down the block in great profusion. This plant, however, is best grown in small pans, being more secure and giving much less trouble.

TREATMENT OF IMPORTED ORCHIDS.

Imported plants require most careful treatment on their arrival from abroad, as a large number are so severely injured at the commencement, and in many instances killed outright. The experienced Orchid cultivator, however, knows what is required to get them into a strong healthy state of growth, but in the hands of the inexperienced they dwindle and perish for want of proper treatment. It is sometimes the case that the plants have stood the journey well, and when unpacked look quite green and fresh, having scarcely lost a leaf. But if these were unpacked and suddenly exposed to strong light and moisture, many, if not all, of the green leaves would probably turn yellow or fall off with but very little warning, and of course greatly weaken the plants. Those who import Orchids for almost

immediate sale by auction are naturally anxious that the plants should look well and fresh in the salerooms, and at as early a period as possible, and to obtain this result the plants are placed in a moist, darkened house, and frequently no attempt is made to really harden them off. It is necessary, therefore, for amateurs to be on their guard and very careful with newly imported plants, getting them gradually accustomed to heat, light, and moisture, for if this is done too rapidly, and too liberally, the foliage may drop off considerably, and perhaps the pseudo bulbs decay.

When the plants are received, all useless decaying foliage, roots, &c., should be removed carefully; and this done, the plants should be placed in a shady part of the Cool-house, on the stage, and kept free from water and in an upright position, the moisture of the house being sufficient for one or two days. The foliage and pseudo bulbs will soon commence swelling and become plump, and occasional waterings may then be given to the roots. As soon as the new growth or roots appear, the imported plants may be potted or placed in baskets or pans and then treated as established plants, watering them carefully as required. Some growers suspend the newly imported plants by the roots with the growth downwards, in the shade of the house, in order that no water shall lodge about them, receiving only the moist atmosphere of the house; but I am not in favour of this plan, and prefer placing them in an upright position from the first, as I have already explained. Experience has shown me that when suspended the imported plants do not so readily resume their normal functions of growth, the delay being much less when placed in an upright position. Should they, however, belong to the Cattleya or Warm-house section, they may be removed there after being a few days in the shaded house. When potting or placing them in baskets advantage should be taken of this opportunity to form well shaped, compact plants, as frequently the imported plants, as taken from the branches of trees or when growing, are spreading and ill formed. In potting these, it is necessary to divide the mass, especially with Cattleyas, and place the parts together, so that the leading growth is placed in its proper position, and this can be done without the slightest injury at this stage, and a well shaped plant will be secured.

In potting the plants it is a great mistake to leave a mass of the old roots on them, as these, when confined in the pots,


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soon decay and become an inert mass of decomposed soddened matter, which is most objectionable and injurious to the new roots that will be formed. These old dead roots should be severely dealt with, and all taken clean away to the pseudo bulb, as also all dead leaves or bulbs. With Odontoglossums and Dendrobiums a few of their old roots, cut back to two or three inches long, may be left on the plant, being useful in helping to keep the plants in position when potting them.

PROPAGATION.

Propagation of Orchids, or, speaking more correctly of some kinds of Orchids, is slow indeed, and often unnecessary, as healthy and vigorous plants, that will flower the first year, may be bought at a very low price; yet it is sometimes desirable to increase the stock of a very rare and expensive sort, or even an exceptionally good variety of a common species, in fact any other kind one may value and wish to propagate. Such free growing kinds as the Calanthes, Pleiones, Cypripediums, Thunias, Masdevallias, Oncidiums, and Odontoglossums, when in a vigorous condition, readily increase in the number of leading growths without artificial aid, and if more stock is required it is easily obtained by dividing the plants. Cattleyas, Lælias, and Dendrobiums may also be increased by division, and this can be hastened somewhat by the use of a knife. Fig. 13 (*see page* 77) shows one method whereby a Cattleya or a Lælia can be made to break back through severing the rhizome, as shown in the illustration, but the resulting growths are generally weak, and several years elapse before they are strong enough to bloom. Cattleyas and Lælias sometimes have double breaks, forming two new pseudo bulbs from an old one, but it frequently happens that, in the following year, one only of these new growths will take the lead and the other remain dormant, and if left undisturbed will often remain in this state for several years. When it is seen that both of the new pseudo bulbs are not going to start into growth at the same time, the weakest of the two should be severed from the parent plant close to the pseudo bulb, and it will then be obliged to start into growth on its own account. The incision should be made with a sharp knife, care being taken not to cut the roots or injure any other part of the plant. The severed portion will then make a new pseudo bulb the same year, provided the operation was performed in the spring, and in the following

spring they will grow faster and surer if taken away from the parent plant and potted into small pots or baskets.

The propagation of the Dendrobium is easy, but is not practised so much as would be the case if many of the most beautiful varieties were not imported in such large quantities, strong plants being obtainable at such low prices as to render propagation unnecessary, unless in the case of an extraordinary good variety or a garden hybrid. When it is desired that young stock should be raised of Dendrobiums, the old pseudo bulbs, which it is found may be cut away without injury to the plant, may be laid upon sphagnum moss, placed on a shelf or some other suitable place, and kept moist until the young growths appear, and in due time these will form healthy young bulbs.

INSECT LIFE, CLEANLINESS, AND REMEDIES.

Cleanliness is a great point in the cultivation of Orchids, as well as with other plants, such as the removal of all rubbish from under the stages or elsewhere. Whitewashing the walls once a year, scrubbing the stages and pots occasionally, cleaning and sponging the leaves of the plants, all helping to keep down insect life, which, if unchecked, soon becomes very troublesome. There are numerous kinds of insects which are enemies to the plants, and for the wellbeing of the latter it is essential that all these pests should be kept in check. A camel's hair brush and a piece of sponge used by careful hands, and with clear soft water, are the best and most effective tools with which to clean away insect life from the plants. Insecticides, whether home made or otherwise, are always more or less dangerous, and often lead to the rotting away of the young growths of some of the more tender plants, such as Chysis, Stanhopeas, Dendrobiums, and Phajus.

Tobacco Water can be made by well soaking a half pound of common twist tobacco in hot water, adding a half pound of soft soap, which is sufficient for four gallons of water, and makes a capital solution, which is both safe to use and effective, and into which the plant may be dipped for a few seconds when affected by thrip or aphis, taking care that the water is of the same temperature as the house. If the solution is very strong it will be safest to dip the plant into clean water after the lapse of a few minutes, but if of the proper strength the solution may be allowed to dry on it. The danger to be avoided is the lodgment of any portion in the

young and tender growths, which easily rot from this cause, therefore it is best to be cautious and well dry the liquid out of the hearts of the young growth with a camel's hair brush.

There are many chemical compounds made and freely advertised for the destruction of insect enemies to plant life, all of which may be good in their way, if used carefully, according to the directions accompanying each, and are not injurious to plants. I find "Killmright" an excellent insecticide for dipping the plants in, also for washing them, using it in the proportion of six ounces to four gallons of soft water, and even the flowers when immersed in it are seldom injured.

FUMIGATION is of great assistance in the prevention of insect life, and it can be applied without injury to either foliage or flowers, when used in the form of "Campbell's Rolls" or the "Lethorion" (Vapour Cone). It is safest to fumigate under rather than over the directions issued, especially for Odontoglossums. When it is desirable to fumigate choose a calm evening for the operation—the atmosphere should not be over dry nor should the foliage be at all wet.

SYRINGING.—The indiscriminate use of the syringe as a check to the spread of insects is not a good practice, either with clear water or water mixed with any insecticide, being ineffective and frequently the reverse of satisfactory.

SCALE, which clings so tenaciously to the leaves of Saccolabiums, Aerides, and Cœlogyne cristata in particular, is a great pest, and where it exists in large numbers, it is a good plan to make up a "lather" of carbolic soap, and paint the leaves with it, allowing it to remain five minutes, afterwards washing it off with a sponge and clear water, when, should the scale still cling to the leaves, a little rubbing will remove it. There is a species of scale which infests Cattleyas and Lælias, especially if the plants are not strong and healthy, which can be cleaned away for a time in the same manner, taking care, however, that the "lather" or insecticide does not get down to the roots, and this is easily prevented by holding a piece of sponge round the base of the pseudo bulb until the operation is completed. Do not attempt to get them off with a sharp pointed stick, as this is both a dangerous and tedious method. "Cross's Electric Insecticide" is the best thing I have tried for ridding the Cattleyas of this pest; it should be used in the proportion of one part insecticide to four of rain water. Apply

it over the insect by means of a small brush of stiffer fibre than camel's hair, thoroughly soaking the scale, and letting it remain until the insect is completely killed—it need not be washed off. The person who introduced this electric insecticide recommends the solution for syringing over the plants for the destruction of red spider, aphis, &c., but I think it best for amateurs to use rather less than is mentioned in the directions, as the young tender foliage of Orchids, as well as other plants, is very easily injured and growth consequently retarded. This applies equally to other insecticides.

Tobacco Powder is a valuable agent for the prevention of thrip and aphis, and should always be at hand. The disagreeable odours arising from fumigating or the use of insecticides are always more or less objectionable, and this annoyance may be avoided by using tobacco powder, which can be purchased from any seedsman, in 1/- or larger tins, and if a little of this is sprinkled into the young growths of the plant no thrips will go near them, whilst those that are there will be speedily destroyed.

Cockroaches are terrible night depredators, and the best remedy I know for their destruction is the well known "Chase's Beetle Poison," which should be used at regular intervals in places where they are most likely to congregate or on any plants on which they have been feeding, taking special precautions to prevent their ravages on the young flower spikes and the tender tips of the roots.

Woodlice also eat the roots, and should be trapped and killed. Various traps are employed for catching these pests, but the best of all, I find, is a potato cut in halves, with a portion of each half scooped out of the centre and then placed with the outside of the potato upwards, examining it every morning.

Slugs.—These are also a great nuisance in the Orchid house, and have a special liking for the young and tender flower spikes. Lettuce leaves can be kept about the plants, and a little fresh bran in small saucers has a great attraction for them, and they should also be diligently searched for at night, using a lamp, for their detection.

Cattleya Fly (*Iosoma orchidearum*).—This is a much dreaded insect, and its larvæ is deposited in the centre of the young growth. Its existence there may be detected, when the young break or growth is about an inch high, as it becomes abnormally

thick at the base and tapers somewhat more to a point than is usual, the growth making but little progress. The only method of exterminating this pest is to cut out the infested growth, in the centre of which the young grub will be found in a more or less advanced stage. If destroyed in this way an effectual stop to their breeding is attained and much harm to the plants prevented; but, should an infested growth be overlooked and the insect come to maturity, a great amount of damage may be done for another year. Luckily this insect is not very general, but it is always best to be on the alert when buying plants.

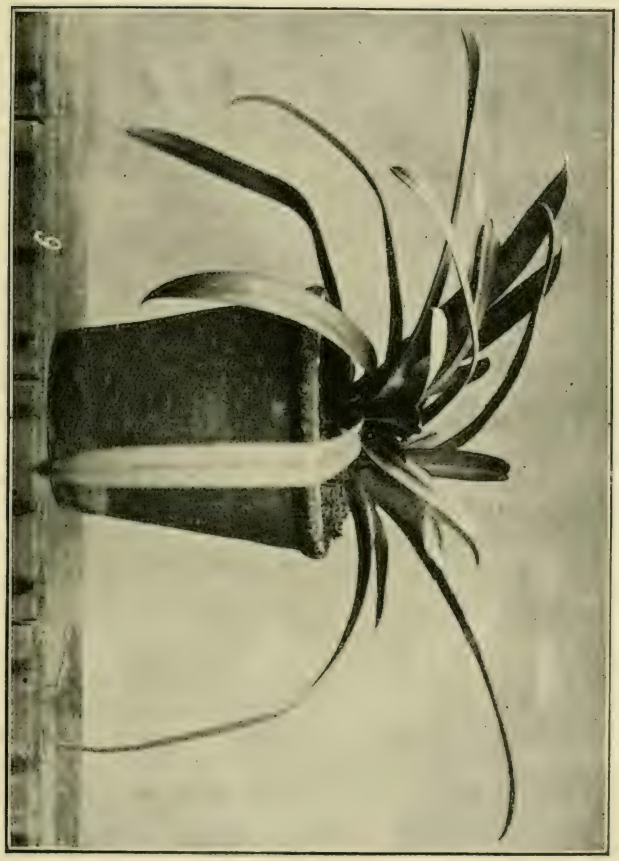
The Dendrobium Beetle (*Xyleborus perforans*) is of small size, but quite large enough to be capable of a great amount of mischief if not promptly checked, and should it get a foothold on the bulbs, as it often does in the Dendrobiums from the Torres Straits, such as D. Phalænopsis, D. Schröderiana, D. bigibbum, D. Dalhousieanum, and D. formosum giganteum, apparently having a liking for, but it does not confine itself to these species. The presence of the insect is indicated by the small cleanly bored holes in the pseudo bulb, both new and old, resembling the small holes found in old worm-eaten furniture; should these holes escape notice the leaves soon assume a yellowish appearance and the pseudo bulbs begin shrivelling about an inch below the holes. If the pseudo bulb is cut open, a nest in a small cavity will be found, containing one or more of the beetles, and the surrounding tissues will be in a state of decay. It is an open question whether the holes are first pierced by the adult beetle—an insect nearly the size of and resembling an ant—and the larvæ deposited therein, or whether they are hatched in the pseudo bulb and afterwards eat their way out of it, as is the case with the Cattleya fly. This enemy may soon be stamped out if proper and timely precautions are taken. I advise an examination of the plants occasionally, and if any traces of the beetle are found, to cut away that portion of the pseudo bulb and burn it; in fact, should the plant be found to be badly infested, burn it altogether, and give the remaining plants a dressing of some insecticide.

Red Spider.—This insect pest is most troublesome, and on Dendrobiums more than any other Orchids; when plants are attacked by them and are unnoticed, serious results may follow, as they greatly reduce the vitality of the plants. They usually

attack the under surface of the young tender foliage, and their presence can be detected by the leaves showing a whitish appearance on the upper as well as the under surface, which becomes more and more plainly visible as the insects increase, which they do very rapidly, causing the leaves to curl and dry up and probably fall off, almost completely arresting the further progress of any growth in course of formation, and greatly interfering with or destroying any prospects of flowering the next season. On the first appearance of this insect, immediate steps should be taken for its destruction, and a constant surveillance maintained of all Dendrobiums and other plants growing in the same house in order to stop further ravages. Sponge the leaves occasionally with clean water, say every two or three days, until they disappear, but in desperate cases use insecticides, mixed as previously advised, and sponge about once a week. Red spider will come, as other nuisances do, notwithstanding the most careful attention, and the conditions under which they are most likely to increase and thrive is that where there is a lack of moisture and the atmosphere is dry and hot from excessive fire heat.

ORCHIDS FROM SEED.

Raising Seedling Orchids is most interesting work, but the raiser must be prepared to exercise a great deal of patience, as with many of the species some years will elapse after the tiny seeds have germinated before the flowering stage is reached, whereas, with others, the period will be shorter; Cypripediums, Masdevallias, and Calanthes for instance, will, under good treatment, bloom in three or four years. Dendrobiums require a longer time, whilst Cattleyas and Lælias and some others do not bloom perhaps under 7 to 12 years, but despite this slow progress, keen interest is felt by the raiser and cultivator of the plants, from their earliest stage until they flower. Fertilisation is the first step towards obtaining seed, and this is done by what is termed "crossing," but not in a haphazard way. An intelligent hybridist exercises an amount of thought as to ultimate results and the means of producing them, and of course takes his chance of obtaining hybrids of great merit or otherwise. It is of no manner of use crossing flowers belonging to two different genera, such, for instance, as an Odontoglossum with a Cattleya, or a Dendrobium with an Oncidium, as the results would be nil. Genera having a close resemblance in form and



structure may however be crossed with more propriety; Cattleyas, Lælias, Sophronitis and Epidendrums having a close resemblance in structure fertilise more readily. Oncidiums and Odontoglossums also cross freely, and form pods of seeds, but I believe very few hybridists have been successful in raising plants from these crosses. Even Oncidiums and Odontoglossums, if kept to their own genera, are most difficult to raise from seed, very few instances being as yet reported. Cypripediums are the most easy to raise, and have been crossed and recrossed to such an extent that the family is now a very extensive one, and of late years many beautiful hybrids have been produced; as also of Dendrobiums and Cattleyas, and no doubt many more surprises are in store, and other treasures will year by year be seen. It is easy to imagine the anxiety and pleasure of the hybridist when he finds his seedling plants advancing to the flowering state and showing their first bloom buds, and still further their development into full bloom. In order to preserve them to a long life the plants should be kept hardy, in exactly the same temperature as the parent plants, and not allowed to suffer from drought. Seedling Cypripediums may be pricked off at any time when ready, as they make rapid progress compared with other Seedling Orchids, but I do not advise the disturbance of small Seedling Dendrobiums, Calanthes, and Thunias after the middle of August, or Cattleyas later than the middle of September; if not done by then let them remain on the surface of the pot in which they were sown until the following spring and then, when growth has commenced, prick off into very small thimble pots.

FERTILISATION OF FLOWERS FOR SEED.

When it has been decided which flowers are to be crossed—the blending and harmony of colours being the leading points in view—the selected seed-bearing parent should not on any consideration be a weakly plant. The pollen may then be taken from the flower, supposing, for instance, it to be Cattleya aurea, and placed upon the stigma of, say, Cattleya gigas (such a cross in their native habitats being supposed to have produced the rare natural hybrids C. Massiana and C. Hardyana). In this case of C. gigas and C. aurea, the former becomes the female or seed-bearing parent, and the latter the male or pollen-giving parent, but the pollen-bearing anthers of the female parent must first be removed. When fertilisation has taken place the flowers will soon

begin drooping and a seed pod form, which will require from nine to twelve months to mature and ripen, then the pod will split and begin to open, and the seeds should be sown at once, for if allowed to remain longer the pod opens wider and the seeds are wasted. To prevent the possibility of the first seeds—and these are considered by some Orchidists to be the only fertile ones—falling, the the plant on which it is intended to sow the seed may be placed directly under the ripe pod, so that the seed, in case of shedding, may fall upon the surface of the compost. The Orchid, in the pot of which the seed is to be sown, should have been potted some months previously with the compost in a sweet and sound condition, not containing too much growing or living sphagnum, or the little seedlings may be destroyed. On this surface, after well watering it, the seed should be shaken, afterwards gently spraying with a fine syringe or watering can, so as to settle the seeds amongst the compost, the plant afterwards being watered when requiring it, but very gently at first, so that the seeds may not be washed too deeply into the pot, or away altogether.

I have had the best results from seeds sown in shallow pans or baskets in which Orchids were growing and suspended from the roof. If the seed is fertile and in a state for germinating quickly, it will show signs of doing so in from three to six months, when they assume the appearance of small green globules about the size of a pin's head, from the centre of which a tiny leaf will soon form, and in this early stage these may be transplanted; indeed, it is best to transplant them as early as possible, for frequently the sphagnum surface on which they are growing becomes stale and dry, and woodlice, slugs, or ants cause the seedlings to disappear; but if taken away when they are large enough to be moved, with a sharp pointed stick, on to some new, sweet compost, a fresh impetus is given to the little plant, and they then get a firm hold of the material in which they are for a while to find a home, and which is so necessary for their wellbeing. When the seed does not show signs of growth in from three to six months, it rarely vegetates at all.

I prefer pricking off the little seedlings into what is known as thimble pots (one inch in diameter). These small pots should be half filled with small bits of charcoal or crocks, then filling level to the rim with chopped sphagnum moss and best fibrous peat, with the dust shaken from it, adding a little silver sand,

mixing it well together and pressing it moderately firm into the pots. I then press down the compost with a pointed stick, making a furrow all round close to the rim of the pot, just sufficiently deep to admit and steady half-a-dozen of the little seedlings, using the pointed stick in doing this, and I moisten the tip of the stick, generally with my tongue, as the tiny plants then adhere to the point and can easily be deposited where required. Previous to filling the pots they should be soaked in water, especially if new, or they quickly absorb the moisture in the small amount of compost so necessary for the young seedlings. The compost should also be thoroughly damped previous to being used for the seedlings, after which the watering of them is a delicate operation, and must be done with the greatest care, until the little plants are steadied by their own roots. The pots containing the little seedlings are best nursed in the small wood baskets used for Orchids, accommodating from eight to a dozen pots in each, and suspending them close under the roof, where they are shaded from the direct rays of the sun. The baskets in which the pots are to stand should have more cross bars fixed in the bottom, to prevent their falling through—the air will then pass up between them and lessen the chance of too much moisture collecting around them, which is to be avoided. These very small pots, however, dry very quickly, and should be examined at least once every day and water given to the dry ones. I usually apply the water by dipping the hand into the water and let it drip gently from the fingers on to the plants, but it can be done in various other ways, so that it is done gently and without disturbing the little plants. Especial care should be taken with the seedlings during their resting season, as such small plants will not stand the same amount of drying and resting as established plants which have large pseudo bulbs and have a much larger mass of material about their roots to retain the moisture, the probability of the seedling plants becoming seriously dry must be guarded against. Some cultivators recommend that they should be kept wet and in a growing state, both winter and summer, but I object to this treatment on the ground that although the plants may possibly be brought into bloom a little earlier, those that have always been stewed in heat are seldom strong, nor have they the robust constitution necessary to maintain a lengthened existence: it is, therefore, wisest to

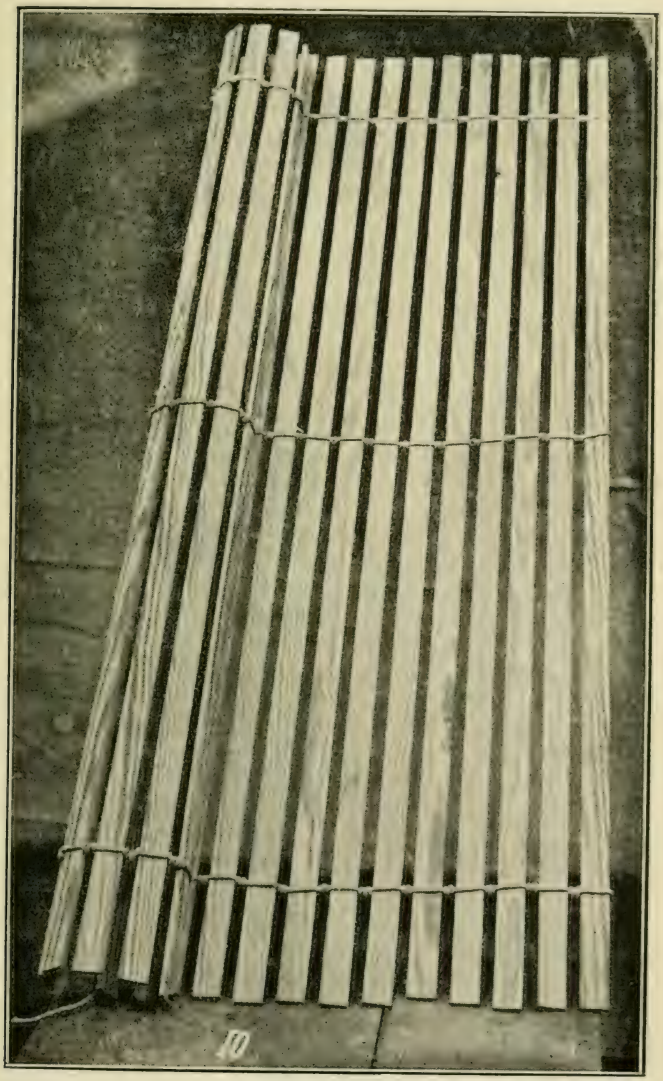
grow on the seedlings in a similar temperature to that in which the old plants have been grown.

DISEASES OF ORCHIDS.

Orchids, like all other plants, are subject to disease, but this appears most frequently where a wrong course of treatment has been followed. Cattleyas and Lælias are sometimes attacked by a fungoid growth which causes the pseudo bulbs and leaves to be marked their whole length with black marks and spots, and if not stopped in time it quickly destroys the plant by causing the pores to rot and become putrid. When these marks are observed the darkened point should be cut through with a sharp knife up the entire length of the mark, and a little dry slacked lime rubbed into the cut—this will sometimes prevent the disease from spreading any further. The disease, however, rarely occurs amongst healthy plants, and it may generally be attributed to a badly ventilated atmosphere, or to the compost about the roots being in a highly decomposed state. The genus Phalænopsis are subject to a disease known as "Spot," which, if not cut out and powdered with lime or charcoal dust, will quickly spread. This "Spot" is caused by bad ventilation, and when the growth is too "sappy," or from an excess of moisture during the dull days of winter. The foliage of Odontoglossum vexillarium is also subject to spotting, but only when it is grown in too cold a temperature, kept too wet, or when insufficient air is given during winter. The same may be said of Vanda cærulea, which is a plant that must be grown in a light, airy, and moderately warm atmosphere during the winter, or the leaves will become badly spotted. In fact all Orchids have some ailments, more or less severe if their treatment is wrong, and the safest plan is to well ascertain their requirements and see that these are obtained as nearly as possible.

WATERING AND RESTING ORCHIDS.

This must be regulated by their season of growth. For instance, a Dendrobium just starting into growth in early spring will require only very little water, just enough to prevent the compost from becoming dust dry, as the old pseudo bulbs at this


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stage support the young growth with nourishment. When the growth gets a few inches high it will begin to make roots on its own account, and it is then that water may be gradually increased. Encourage this growth until three or four leaves have appeared and the bulb is formed, never allowing the plant to get thoroughly dry. I do not mean by this that it should at any period be kept constantly saturated. After the bulb is quite matured, water must again be gradually withheld, and it will then become so hardened that during the winter months water can probably be withheld for a long period, without shrivelling from the dryness of the atmosphere or the amount of fire heat required. This applies also to such plants as Coelogynes, Cattleyas, Lælias, Anguloas, Catasetums, Mormodes, Epidendrums, Lycastes, Chysis, Trichopilias, Pleiones, and Thunias.

The following, viz.: Oncidiums, Odontoglossums, Vandas, Aerides, Saccolabiums, Phalaenopsis, Miltonias, Masdevallias, Cymbidiums, Angraecums, Aclas, and Cypripediums, will require more water at the roots all through the winter months, but those which are dormant should be kept comparatively dry, only watering when the surface of the compost assumes a white appearance and is slightly crisp to the touch. It will be as well for amateurs to adopt the following rules in watering:—Never give a plant a little water because it is not dry enough to water thoroughly. If there should be any doubt as to the plant being sufficiently dry to require watering let it remain until the following day, when, should it be in a suspended pan or basket, let it be taken down and dipped in water, or, if in a pot, give it a good drenching with the watering can, bearing in mind that the Orchids in the smaller pots require more frequent waterings than those in the larger ones—always watering the compost, not the foliage. Make it a practice, should any water lodge in the young growths of such species as Cattleyas, Lælias, and Dendrobiums, to dry it out by means of a camel's hair brush. With Orchids of the same character as Odontoglossums and Oncidiums, this precaution is unnecessary during the summer months.

Resting is merely a term employed, which denotes that the plant has finished its season's growth, and henceforth lapses into a dormant state until the proper season arrives for renewed activity: plants which are at rest require but little water.

DESIRABLE POSITIONS FOR THE PLANTS.

In our glasshouses we cannot closely imitate the conditions under which the plants grow in their native habitats; still it is decidedly advantageous to their wellbeing when we can arrange to reproduce as nearly as possible their natural surroundings, and this, combined with good attention, are undoubtedly the two most important points to be observed in their cultivation; for if an Orchid is given a place which suits it, and due attention is paid to the plant and its natural requirements, success and credit to the cultivator will be assured. Theory is, however, a great help to the practical man, and much information may be gained from the writings of others, which, if used in conjunction with experience already acquired, will lead to a better appreciation of his work and bring out many important points for his study and consideration, thus increasing each year his store of useful knowledge, a circumstance not to be despised by any cultivator, however eminent. When Orchids are growing satisfactorily, and look healthy and well, it is a conclusive proof that the conditions under which they are grown, and the position they occupy, are in every way suitable.

Sickly plants are always to be found in every collection, and their unhealthiness may be attributed to various causes, the true one invariably being traced to the fact that some simple want has not been attended to or is not understood. Thrip and other insects find it more difficult to make headway and increase when plants are in their proper element. As to position, some plants will thrive the year through without change; whereas, with Dendrobiums and others frequent changes and rearrangement are beneficial.

Some Orchids, such as Cypripediums and other Cool-house kinds, thrive better in the shade, whilst Cattleyas, Lælias, and Dendrobiums prefer sunlight. Some do best when suspended, others placed on a side stage, whilst instances have occurred when a plant failing to grow at one end of the house has thrived and grew luxuriantly when moved to the other end. A casual visitor would probably fail to see any reason for this; but it would soon become evident to the grower that the plant experienced a decided advantage in one position denied to it in the other. In many cases this is caused by the plants getting a better current of air.

I find shelves to be extremely useful in this respect, and use

plenty of them hanging over the paths, from 12 to 18 inches from the glass, also over the door and at the far end of the house, or in any other place where they do not obstruct the light much from the plants on the stages. These shelves meet the requirements of some Orchids to perfection, especially those which require light and air, or are shy bloomers when grown on the side stages with other plants. I shall treat more fully on this subject when referring presently to Cool, Intermediate, and Warm houses.

ORCHIDS IN BLOOM.

When Orchids are in flower they should not be allowed to become very dry at the root, or the flowers will draw too largely upon the reservoirs of the plant, greatly exhausting it, and sometimes lead to its entire collapse the following season; neither should the flowers be allowed to remain on the plant for too long a time, especially if the plant is at all weak. Oncidiums, Odontoglossums, Phalænopsis, and Vanda cærulea, suffer from this cause more than other Orchids, as these kinds generally throw large spikes with a great number of flowers upon them, and should not be allowed to become too dry. Should the plant be in a weak condition and allowed to flower, the blooms must be cut immediately, or the plants will be still further weakened and probably dwindle away. The removal of the flower is no deprivation to the owner, as it will keep a very long time in water. Even where strong and vigorous it is not advisable to allow the spikes to remain on the plant more than a fortnight. Any small glasses or neat little vessels for holding the flower spikes can be judiciously placed among the plants, and but few casual observers would notice that the flowers had been removed from their parent stems.

PLANTS THAT MAY BE GROWN WITH ORCHIDS.

The culture of Orchids need not in any way lead to the exclusion of the beautiful foliaged or flowering plants, and especially ferns, which are generally found in every greenhouse; in fact, it would often prove to be a distinct advantage to these plants to be in the same house, as the atmosphere is more suited to their requirements than that generally maintained in an ordinary greenhouse. There are, however, some plants which

should *not* be grown with Orchids, such as Pelargoniums, Fuchsias, tuberous-rooted Begonias, Hydrangeas, Azaleas, Camellias, Cyclamen, Primulas, and others—these are best grown by themselves, as many of them are very subject to aphis and other pests.

The class of plants most suitable for growing with Orchids are ferns, small palms, and pretty foliaged plants, all of which give comparatively little trouble in growing, are not so subject to insect pests, and are in harmony with the Orchids. There are also some of the more beautiful, and not yet too gaudy flowered stove and greenhouse plants, which will flower well in the Cool Orchid-house, on account of its being kept moist, shaded, and with a genial growing atmosphere. Amongst the many pretty and suitable plants are the winter-flowering Begonias, also some of the charming ornamental leaved section, many of the palms and ferns, Abutilons, Pilea muscosa, Aralias, Asparagus plumosus, Cissus discolor, Crotons, Cyperus, Dracænas, Isolepis, the pretty variegated Panicum for a front fringe to the Orchid stage, Pellonias, Eulalias, Selaginellas, Tradescantias, and many others, but these names are sufficient as a guide.

For the Intermediate Orchid-house, such plants as the following may be used: Allamandas, Aristolochias, Hoyas, Bougainvilleas, Cissus discolor, Passifloras, as climbers on the rafters, but so as not to obstruct light more than can be helped; also Coleus, Anthuriums, and other plants mentioned in the Cool-house list.

For the warmer, or Hot-house plants, requiring more heat, then, such as Alocassias, Gardenias, Nepenthes (the pitcher plant), Eucharis, Gloxinias, Euphorbias, Gloriosa, Ixoras, Hibiscus, Poinsettia, Pancratiums, Pandanus, Crotons, and others. It should be remembered, that when Orchids are grown in company with other plants, the Orchids must have the first consideration, and be given the position most likely to suit them. By standing them on inverted flower pots they can be kept well above the foliage of other plants, thus enabling the air to circulate freely about them, and at the same time admitting plenty of light; in no case must the plants be allowed to become infested with insects or serious results may ensue. If it can be arranged, without danger of shading the Orchids underneath, a few of the best warm greenhouse or stove climbers may be grown and trained to the rafters, but it must



be borne in mind that some of these climbers are subject to mealy bug and other troublesome insects which will need careful watching and attention.

THE COOL HOUSE.

Fig. D. and E. represents a model house, should a new structure be erected for Cool house Orchids, and it should have east and west side aspects, so as to get an equal amount of light. *A.* shows the bottom ventilation, which should be on a level with the hot-water pipes and protected inside with perforated zinc, with the holes not too small, but sufficiently so to keep out vermin. *B.* shows top ventilation, and *C.* shows side ventilation, which is very beneficial to Cool Orchids, if opened slightly when the atmosphere outside is damp and not very cold, but they should not be open in very dry or cold weather. *D.* shows the framework to support the roller blinds, and *E.* the roller blind. *F.* is the end section, showing the centre and side stages, which should be open wood-work, so that the air may have free circulation amongst the plants. *G.* indicates the slates or tiles supported on bricks, immediately over and three or four inches from the pipes, and on these half decaying leaves of trees should be placed at intervals, to throw off a nice moisture impregnated with ammonia from the leaves, and assimilated with the dry heat from the pipes. *H.* is the soft water tank, a great essential in an Orchid-house. If a supply from an outside pressure from waterworks in the town should exist, and an india rubber hose sufficiently long is connected, the entire length of the house can soon be damped down—and this is so often needed in hot, dry weather—thoroughly watering every available space about the floor and stages, without watering the plants over head. If a syringe has to be used for this purpose, much longer time is required.

THE INTERMEDIATE HOUSE.

Such a house running from east to west, the sides having one a northern, the other a southern aspect, would enable an amateur to grow a still greater variety of Orchids successfully—those requiring a great amount of light being placed on the south side, and those loving shade on the northern side. This house is identical in structure with the Cool house, with this exception,

that it is convenient to have the house higher, as some of the Intermediate house Orchids have a taller habit of growth and require more head room; and the side ventilation, except that opposite the pipes, may also be dispensed with. The centre stage need not be quite so high as in the Cool house, and can have wider top space to accommodate tall growing specimens. The same arrangement will be required for the leaves over the hot-water pipes as is advised for the cooler house.

THE WARM, OR EAST INDIA HOUSE

should have the same aspect as the preceding structure, so that full advantage may be taken of the light and shade afforded, and which is so necessary to the occupants of this house. The roof should be high, and somewhat flatter, but well supported, in order that the interior may be utilised to its full extent for suspending plants, many of the Warm-house Orchids thriving much better when near the glass. The centre stage (*A.*) should be rather lower than figured, the soft water tank running the full length of the stage; and it is a good plan to run a one-inch pipe right through the water in the cistern, and connected with the other pipes, so that the water for the supply of the plants may be warmed to about ten degrees above the temperature of the house, as it then gives off a moisture most beneficial to the plants when in a growing state, but care must be taken not to have the one-inch pipe too hot, or steam will be generated to such an extent as to injure the young growth of the plants, causing spot or rot. Should no tank exist, it then becomes necessary to have a supply of water in the house for watering purposes, either in cans, pails, or other utensils, which should be placed in the house sufficiently long to be warmed as nearly as possible to the temperature of the house.

As this structure is high, necessitating perhaps more side glass, it is also a good plan to have roller blinds fixed on the south side of the house, although a permanent shading of whiting, mixed with milk, can be used; or summer cloud will answer the same purpose, but roller blinds are much to be preferred, as they can be rolled up in dull weather. Side ventilation (not bottom) is unnecessary, and what is known as "drip" must be prevented, drip being caused by water from the moist atmosphere condensing on

the roof and running down the sash bars on to the plants, saturating them and causing loss of the young growths and pseudo bulbs. This is most to be feared in the Warm house, where the roof is flatter and a larger amount of moisture is required for the plants, or in cases when the house has not been properly constructed for Orchid culture. Horticultural builders have of late paid much greater attention to this subject, the sash bars being so constructed that all condensed moisture on the roof is collected and carried away by means of a channel or furrow, formed on either side of the sash bars. If the drip is found to be very troublesome, in the absence of these furrowed sash bars, it can be dealt with, to a great extent, by fastening small strips of zinc in the form of a gutter to carry away the water.

Evaporating Troughs, to fit upon the pipes, are invaluable aids to the assimilation of moisture with the atmosphere, and for helping to keep down such insect pests as thrip and aphis. By keeping the troughs regularly supplied with water, and placing in them any waste tobacco or other substance containing nicotine, the fumes arising therefrom will have a beneficial effect upon the plants.

MANURE AID TO ORCHIDS.

This is somewhat dangerous ground to tread upon, but a few words on the subject must be written. The structure of an Orchid and method of deriving nourishment being so different to that of most exotic plants, it behoves the cultivator, before applying manure as he does to other plants, to consider what is the proper manure to use, and how and when to apply it. Orchid growers have no doubt used manures, some are still doing so, but as a rule their experiments are made entirely in the dark, sometimes with good results, and at other times the plants give no evidence of any improvement but are frequently the worse for its application. My own experience, gained by practice in cultivation, is, that as a rule, harm would be done by applying artificial manures to the roots of the plants, as advised by some growers, unless under exceptional conditions. Growth can be assisted by applying manure aid atmospherically, and all the help that epiphytal Orchids require at our hands is, that the compost should be kept sweet and sound, and not allowed to get into a sour and decomposing state, using clean soft water and administering pure air, on every favourable

occasion, for they derive so much of their nourishment from the atmosphere by means of their roots and the under surface of the foliage.

Soot water is an excellent thing to apply to the paths for evaporation, but those living in large smoky towns would never dream of applying soot, the air being already sufficiently charged with it. Lime water can also be used, but I doubt if it would be beneficial in districts where the water supply comes through chalk. Guano, in small quantities, sprinkled on the floor occasionally, I never knew to do any harm, and I have often thought that plants showed increased vigour and strength when it was used in this way. I also use liquid farmyard manure, by pouring the contents of a small watering can on the floor occasionally, and of an evening when all is quiet. The evaporation from such stimulants being desirable, not so much for inducing moisture as for producing a manurial stimulant in the atmosphere. Cultivators will also please to remember the plan I have already indicated of providing a supply of new leaves, laid on slates or tiles, over the hot water pipes, to produce evaporation and assist in maintaining an even moist temperature. I have at times poured liquid manure into the troughs on the hot water pipes with good results, the ammonia from it escaping gradually into the house.

PROTECTION FROM COLD DURING WINTER.

Although we cannot do without fire heat, every successful cultivator tries to do with as little as possible; of course, duly considering what the requisite temperature should be and the health of his plants require. In very cold weather, when it is necessary to drive the fire hard, an impoverishing aridity in the atmosphere of the house is the result, and even then the thermometer may still show a temperature below the given point. It frequently happens that plants, especially those near the roof or standing near the glass ends of the house, have, in the morning, a heavy dew-like moisture on them, and this sometimes remains on the plants the whole day. This is not a satisfactory state of things for the plant, and is brought about by the condensation that arises from the extreme cold air outside acting upon the glass with very much warmer air inside. A simple and effectual remedy in such a case is to apply some kind of protecting material

in cold weather, such as garden mats, canvas, or pieces of sailcloth, either of which would make a difference of from five to ten degrees in the warmth of the house, especially when the doors and further end of the house is protected. Some persons leave the roller blinds in position for winter protection of the roof, but, as a rule, the canvas is too thin to be of much service and soon wears out with the winter weather and storms. Whatever is chosen for a covering should be so arranged as to be convenient for use and removal when not wanted. I have occasionally kept the roof so covered, both night and day, in extremely cold or very windy weather, for if the plants are receiving plenty of light at all other times, a day's comparative darkness now and then does no harm.

EXCESSIVE HEAT TO ORCHIDS.

I have already deprecated any attempt to force Orchids prematurely into flower or growth, by giving them a much higher temperature than they ought to have. To ensure free healthy growth, I wish again to warn young growers of the dangers to the health of the plant by so doing, for, from this cause alone, many plants are weakened in constitution, and get into a debilitated state, from which they do not easily recover. This will apply to all species, but more especially to those recognised as "Cool house Orchids," these certainly will not submit to excessive heat; and nothing could be more suicidal than to attempt to force the flowers to expand at a given date, by placing the plant in extra warmth. Should this be done for exhibition, or for any other purpose, no surprise need be felt if the plant is reduced in vitality, and become an easy prey to insect pests; while no appreciable difference is made in the time of blooming, indeed, in some cases, it is later, while in others the flowers may be a little earlier but of an inferior quality, and shorter lived than when allowed to develop gradually in their proper temperature. Instead of forcing, it is much safer to retard the blooming, but even this I do not recommend. The time of flowering of a few Orchids may, however, be made earlier or later than its usual period, if desired, by a systematic gentle application of more warmth or cold during the time the plants are pushing their flower spikes. The treatment for the first year may make very little difference, but in the succeeding years it will be more apparent, and the plants remain healthy and

strong. Some species of Dendrobiums are more amenable than most Orchids to this treatment, in the matter of flowering at an earlier date, and when sound plants are grown of such species of Dendrobium as Wardianum, nobile, heterocarpum, Ainsworthii, lituiflorum, Devonianum, and Pierardii, the greater part of which flower at the latter end of February, it is easy to extend their blooming period, say from January to end of March. I have often had them in flower at Christmas, but it is too early for them, the flowers being weak and few, and the new growth much weakened. If it is desirable to have Dendrobiums by the beginning of February, they should be taken from their resting quarters with a cool, dry temperature of between 40 to 50 degrees, and, after being sponged over, and examined for red spider, and tied up neatly to fresh sticks, the plants should be removed and gradually inured to a warmer place in the Intermediate house, where they can have plenty of light, watering them very carefully, or the flower buds may turn yellow and die, or run to growth instead of flower. The warmth of the Intermediate house will be found sufficient for getting the Dendrobiums into bloom a little earlier, if the instructions given are followed, and the blooms will be better coloured than if pushed on in a warmer house; but even with this genus no excessive measure must be brought to bear upon them, either to "retard" or to "hasten," or small, weak, and puny growths will result.

Treatment of Orchids throughout the Year.

JANUARY.

Cool House.—*Temperature in the day with sun, 58°: in the day without sun, 53°: night, 50°: morning, 45°.*

During this dark, dull month scarcely any potting will be required, but attention should be given to cleanliness, ventilation, watering, &c. Open the bottom ventilators, more or less, in accordance with the outside conditions; and if that should be damp and mild, the top ventilators may be opened a little, especially on the leeward side, and a little fire heat used to temper the atmosphere and promote the circulation of air. Should excessive cold weather prevail, it will be best to close all the ventilators and have the hot-water pipes sufficiently heated to keep the thermometer at the proper degree of heat, also affording more moisture both to the roots and in the atmosphere than is required in dull, damp weather. Generally speaking, all growing plants should be more sparingly watered at this season of the year. Plants which are dormant (resting), such as some of the Dendrobes, Cœlogyne, Anguloas, &c., may have sufficient water only to prevent the pseudo bulbs from shrivelling. The autumn-flowered Pleiones may be repotted and suspended near the roof, giving but little water at first. Examine all the plants and clean them, wash their pots when wanted, look well after slugs, and if any signs of thrip should be visible—and their work may soon be detected in the centre of the young growth, which then assumes a light-tinted, sickly appearance and showing a small watery-looking mark—then dust a pinch of tobacco powder well into the growth affected. Thrip and slugs are especially fond of the young flower spikes and buds as they appear from the sides of the pseudo bulbs, and should be watched for as previously advised.

INTERMEDIATE HOUSE.—*The temperature, day with sun, 65°; day without sun, 58° to 60°: night, 58°: morning, 53°.*

Keep the temperature up in cold weather and temper the atmosphere by the admission of fresh air, given chiefly through the bottom ventilators, and damping down the floors, &c., once or more a day as may be requisite; and during mild weather a few degrees may be added to the temperature, but avoiding any approach to a stuffy, close atmosphere.

When in smoky towns fogs are common, and during the time they prevail the atmosphere should be kept rather more moist than usual; and the Evergreen Orchids, especially those which should be *kept dry*, such as Cattleyas and Lælias, should then not be too dry at the roots, or the foliage would probably suffer and prematurely drop, greatly weakening the plant. Immediately after a dense fog it is most advisable to look over the plants and sponge the leaves with clear rain water, in order to remove the sediment deposited thereon.

THE WARM, OR EAST INDIA HOUSE.—*The temperature, day with sun, 70°; day without sun, 65°: night, 63°: morning, 58°.*

This heat should be maintained if possible with a little bottom air, and moisture applied, by damping down the paths, &c., according to the amount of fire heat employed Cypripediums may be repotted; Calanthes which have done blooming should be placed on a shelf close to the glass and kept dry. Use tobacco powder on all plants when thrip is found, and keep a sharp look out for red spider on the young foliage of Dendrobiums, and any Dendrobiums in bud or in flower may be kept a little moist at the roots.

FEBRUARY.

COOL HOUSE.—With increased sun heat the day temperature of this house may rise three degrees, continuing the same care in ventilating, watering, and the detection of insects, and always having a sufficient amount of fire heat and no more. The repotting of Odontoglossum Alexandræ and its allies, as they go out of bloom and begin making new growth, may be proceeded with, and pick over the surface moss of others which are in good condition, and top dress with fresh sphagnum and peat.

INTERMEDIATE HOUSE.—*The temperature same as for January.*

As the potting season will now be coming on, have a supply of good fresh sphagnum moss ready for use, also some good fibrous peat at hand when wanted, and mixed as I have already explained. Have tie-up sticks ready of various lengths, and paint them green; and procure some clean leaves of trees ready for placing over the hot-water pipes as previously recommended. Get plants cleaned, and look well to the Cattleyas for the ravages of scale, &c., alluded to on page 41, and guard against thrip, especially on Miltonia (Odontoglossum) Vexillarium, by dusting tobacco powder into the young growths.

WARM HOUSE.—*The temperature to be maintained the same as last month.*

Phalænopsis may now be attended to, and a fresh supply of tree leaves given over the pipes. Let a sufficient quantity of fresh air be admitted with care daily, avoiding cold draughts which would check growth and produce other evils. Should the Orchid houses form a range and open one into the other, ventilation can be obtained at this time of the year by opening the doors, and if it can be managed, air from the cool house should pass on to the warm house through the open doors. Cockroaches congregate mostly in this house and should be poisoned.

MARCH.

COOL HOUSE.—*Temperature, day with sun, 63°; day without sun, 60°: night, 55°: morning, 50°.*

Continue the watchfulness in general matters. The days are now gradually lengthening and the light stronger, and watering at the roots may now be increased without so much fear of bad results following. See also that the roller blinds are fixed on the house early in the month so as to be ready for use, as it is best not to expose Cool house Orchids to sudden bursts of bright sunshine at first, as it sometimes causes an excess of bronze tinted colours in the foliage of Odontoglossums, which in a modified way is not so objectionable, as it indicates sturdy health from being kept hardy and from exposure, but it is not well to have too much of it, as it sometimes leads to a loss of foliage. Ventilate freely on all suitable occasions, both night and day, but beware of piercing east

winds, which oftentimes are accompanied by bright sunshine and runs the thermometer up rapidly, and prompts the cultivator to put on more air to reduce it. In order to avoid this keep the ventilators closed, thereby preventing the cold piercing wind from entering the house; and, if necessary, lower the heat of the hot-water pipes, and shade by running down the roller blinds.

INTERMEDIATE HOUSE.—*Temperature, day with sun*, 70°; *day without sun*, 65°: *night*, 63°: *morning*, 58°.

The season of active growth is at hand, and, with more warmth, the plants will soon begin to push out roots, and as soon as this is seen the plants should be repotted, supposing they are out of flower; a slight increase of water may be given to the roots, seeing that the water does not lodge in the young breaks. Get roller blinds fixed in readiness for use and for protection from sun, and when there are cold cutting winds keep the house closed. Watch for the Cattleya fly alluded to on page 42.

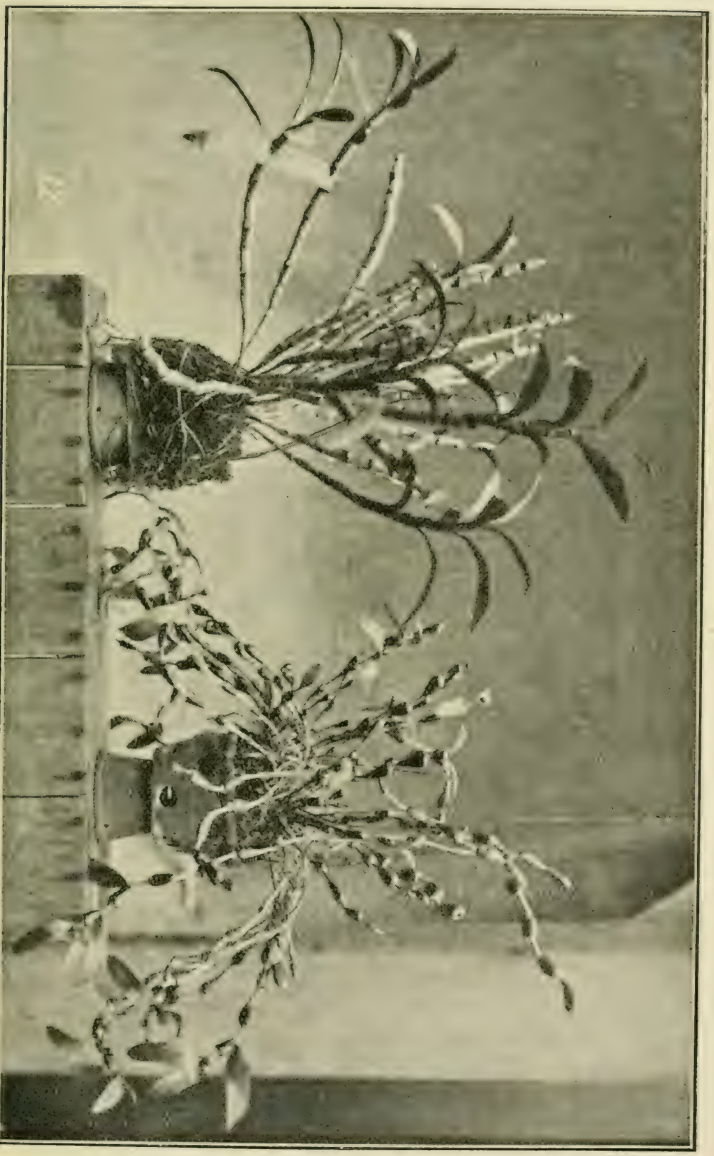
WARM HOUSE.—*Temperature, day with sun*, 75° *to* 80°; *day without sun*, 70°: *night*, 68°: *morning*, 63°.

Be careful that Dendrobiums are not over watered, and protect Orchids from drip from the roof (*see page* 61). At this season the condensed moisture sometimes gets frozen underneath the glass, and in thawing drips on to the foliage, causing the young growth to damp off. Thunias and Calanthes may be repotted (*see* Cultural Directions, *page* 28). Look out for red spider, and sponge the leaves with insecticide. Much care is necessary in ventilating, so as to ensure circulation without the atmosphere becoming cold.

APRIL.

COOL HOUSE.—*Temperature as advised in March.*

We often have changeable, trying weather in this month demanding constant watchfulness, and it is better to use the shading freely than to admit cold air through the ventilators; keep a regular supply of moisture on the paths, stages, and other surfaces. Very little heat will now be wanted from the hot-water pipes in this house, but as the nights are often cold, a little heat should be given. Be always on the look out for thrip, for if it gains a strong foothold this month it will probably remain all the summer, in larger or smaller quantities. The repotting of Odontoglossum Alexandræ



and others of similar growth should now cease, and not be renewed until early autumn, or they will be unable to re-establish themselves before hot weather sets in, and shrivelling will occur. The repotting of all other cool Orchids may be pushed on with as they are ready.

INTERMEDIATE HOUSE.—*Temperature generally the same as for March, but a few degrees higher does no harm if the weather is warm, but fire heat may be dispensed with in warm weather.*

Shading should now be in use for a few hours when the days are bright with sunshine, but inure the plants gradually to the influence of the sun after the dull winter; and with bright sunshine by day and frost at night it is advisable to maintain a sufficient amount of moisture, as the plants, if in too dry a state, may suffer at such times—even the Mexican Orchids which will stand a great deal of sun become scorched when too early exposed after so much sunless weather. Where the roots of Cattleyas and any Orchids may be pushing into growth the plants should be at once taken in hand and repotted, or top dressed as may be best, for if the new roots are allowed to get too long before doing so they get injured. Damp down the floors, &c., twice a day at least.

WARM HOUSE.—*Temperature, day with sun,* 80°; *day without sun,* 73°: *night,* 70°: *morning,* 65°.

Shading should now be in position ready for use. This month is generally a busy one, and the sooner the plants are attended to after flowering and got into their growing quarters the better. It is necessary to be very careful in watering Dendrobiums just starting into growth, especially D. Bensonii and D. superbum. A uniformly moist atmosphere should at this season be constantly maintained, allowing it to become somewhat dry at mid-day, and keeping a watchful eye for red spider and thrip.

MAY.

COOL HOUSE.—*Temperature, day with sun,* 65° *to* 70°, *or as low as it can be kept in fine weather; in the day without sun,* 65° *to* 68°: *night,* 53° *to* 60°: *morning,* 55°.

Well damp down at least three times a day in hot weather at this season, and spraying the plants slightly overhead will do no harm if done in the afternoon of a drying day, but I do not

approve of damping the plants overhead unless it is necessary in hot, drying weather. If the atmosphere is properly attended to fire heat should not now be requisite, provided the weather is not exceptionally cold for the time of year. When the sun gets upon the house in the morning let down the blinds, allowing them to remain down until all fear of the temperature being increased has passed. Do not entirely close the Cool Orchid-house by shutting all the ventilators as the sun is declining, and at the same time damping down the house, or the temperature becomes too hot for the plants, and much moisture then is needed. Cool Orchids object to this close, moist heat, therefore, air should be left on day and night, in large or small quantities, as required. Attend to repotting as the plants go out of flower. Should there be any great difficulty in keeping down the temperature of the house owing to its exposed position, then, in addition to the roller blinds, a permanent shading of "summer cloud," or some similar mixture, applied thinly on the glass, will probably be beneficial during May, June, July and August.

INTERMEDIATE HOUSE.—*Temperature, day with sun,* 75° *to* 80°; *day without sun,* 70°: *night,* 65°: *morning,* 60°.

Damping down will now be necessary, morning, noon, and night; and the plants examined each day, and watered only if they are in a condition to need water, for plants, even whilst growing, should not be kept in a saturated condition. At this period of the year, the plants should occasionally be sprayed overhead with clear soft or rain water, especially after a dry, hot day, doing this in the afternoon, when the air has been reduced and the blind rolled up, and warmth from the sun's rays is declining. The Mexican Orchids, or those growing in the most sunny parts of the house, may be well syringed, as the plants from having little or no shading over them get dry quickly, and it also helps so much in checking the work of injurious insects. By reducing the air whilst the sun is still acting upon the house, an amount of warmth is stored which will last until late in the evening when a little fire heat may be necessary, particularly should the night be cold.

WARM HOUSE.—*Temperature, day with sun,* 80° *to* 95°; *day without sun,* 75° *to* 80°: *night,* 75°: *morning,* 68° *to* 70°.

Attend well to the temperature and atmosphere by ventilating carefully, so that no draught is caused, and the admitted air is as

pure as possible. Ventilate chiefly on the leeward side, and use shading during the hottest part of the day, but not too early in the morning, and rolling up the blind rather early in the afternoon, whilst the sun has some power, at the same time reducing the ventilation and thoroughly damping down the house, thus creating a warm and very moist atmosphere which will last until late in the evening, when it may be necessary to have a little warmth in the pipes to prevent too low a temperature.

JUNE.

COOL HOUSE.—*Temperature, day with sun, as low as it can be kept; day without sun, also as low as possible when the weather is hot; night,* 60°: *morning,* 55° *to* 60°.

Great injury will be inflicted on the plants during the summer months, if allowed to suffer from drought at the roots. Examine the plants each morning, and water those where the sphagnum moss shows a whitish colour. Thrip breed rapidly at this season, and, like all other insects, must be kept down by the methods already indicated. Instances of over-heating now will be rare when the plants have been properly potted, and the compost as well as the plants are in good condition.

INTERMEDIATE HOUSE.—*Temperature, day with sun,* 75° *to* 80°; *day without sun,* 73°: *night,* 65° *to* 70°: *morning,* 65°.

Plants will now advance very rapidly, and in all weathers the plants must have every encouragement to promote quick growth by giving liberal supplies of water at the root, and moisture in the atmosphere of the house, and this can be easily secured by damping down frequently provided proper ventilation secures a gentle circulation of fresh air. A fresh supply of tree leaves saved from last year should be placed under the stages over the pipes, and watering now should be done in the afternoon or evening. Cattleyas, and indeed other Orchids, often have a little shrivelled appearance after flowering, but soon regain vigour and plumpness with liberal treatment. Be sure and keep a sharp look out for the Cattleya fly.

WARM HOUSE.—*The temperature same as in May.*

Warmth from the sun is most beneficial to the plants at all times, and but little fire heat may now be used, except during cold or chilly dull weather. Keep a sharp look out for the Dendrobium

beetle; and it is advisable at this season to continue a supply of tree leaves, or, failing these, some other material for giving moisture, by placing them under the stages, and thereby materially assisting the plants.

JULY.

COOL HOUSE.—*Temperature same as for June.*

Should the heating apparatus require repairing or altering, this is the most suitable month to get it put right, letting the work be completed as speedily as possible, certainly by the middle or latter part of August. The repotting of all kinds of Cool Orchids, with the exception of the Odontoglossum Alexandræ type, should by this time be finished; and if the sphagnum moss on the surface of the pots begins to cover the pseudo bulbs, it should be pressed neatly down with the fingers whilst it is wet, but it will ultimately become necessary to remove it and substitute a fresh top dressing of sphagnum, which will probably also grow. I have often heard it remarked that Orchids make no growth unless the sphagnum is doing so. That Orchids generally do well when the sphagnum grows freely I admit, but it is not absolutely necessary for the welfare of the plants.

INTERMEDIATE HOUSE.—*Temperature, same as for June.*

If thrip should get a firm hold of the plants, now that they are making growth, the foliage is soon disfigured, but its presence may be detected by the appearance of brown marks on the young foliage in course of formation, and when once the insects get down into the centre and under the skin which shield the young bulbs it is impossible to dislodge them by fumigation alone. Tobacco powder should then be used, sprinkling a pinch down the axils, but it is wisest to look out for thrip in its earliest stage, and be on the watch for any sign of the Cattleya fly, which will attack such species as C. Mossiæ, C. Mendelli, and C. Trianæ in particular.

WARM HOUSE.—*Temperature, same as for June.*

As the new growth of Dendrobiums increase in size, and form fresh roots, a little weak liquid manure may be given (*see page* 62). Dryness at the roots, or a dry atmosphere are most undesirable just now, as the plants are in active growth and should have no check either from this or any other cause. A gentle spraying overhead may now be beneficial in the afternoon or during very dry weather.

AUGUST.

COOL HOUSE.—*Temperature, same as June.*

Continue to maintain a free circulation of air, keeping the atmosphere as cool, yet as moist as possible, bearing in mind that these plants grow chiefly at a great elevation where the atmosphere, although heavily charged with moisture, is breezy and buoyant, conditions which a cultivator should endeavour to imitate. When it has been necessary to use a permanent shading through the summer months, it should now be reduced in density by having a good portion wiped off. Plants in which the pseudo bulbs have completed their growth must now have water supplied to them in lesser quantities.

INTERMEDIATE HOUSE.—*Temperature, same as for June.*

During this month many of the new pseudo bulbs reach maturity, such as Cattleya Trianæ, C. gigas, and C. aurea. The roots should now be watered less frequently, and the plants be placed near the light at the coolest part of the house, close to a ventilator, or they will commence a second growth, and this should be avoided if possible, as second growths rarely come to maturity until very late in the autumn. The two last named Cattleyas having flowered, the old flower sheaths should be entirely removed, as they are liable to decay in dull wet weather, and unless this is done in time the base of the leaf may be affected and droop before it is observed, the rotting or decay passing downwards and soon affecting the newly made bulbs. If the old sheath is cleanly removed by a slight pull sideways, it will slip easily away from the pseudo bulb and render decay improbable.

WARM HOUSE.—*Temperature, same as for May.*

Fire heat, on all occasions, both day and night, may be safely dispensed with during this month. Dendrobiums should be looked over now, and all that have finished up their pseudo bulbs removed to more cool, airy, dry, and sunny quarters, to prevent second growth, always taking care that the change is gradual so as not to give an unnecessary check, and after they are by degrees fully exposed to both air and sun. Many kinds, such as Dendrobium Wardianum, D. nobile, and D. crassinode delight in a long rest, in a house having a cool, free ventilation, and full sunlight. Such treatment greatly assists the plants of such kinds as I have named in acquiring a strong constitution and they flower more freely; but

all the Dendrobiums will not stand this treatment. No more shading should be used than is absolutely necessary, so that the growth may get well matured as it is formed; and produce short, stout, well hardened bulbs, which should be the aim of every grower—thin sappy growths being of little use.

SEPTEMBER.

COOL HOUSE.—*Temperature, day with sun,* 68°; *day without sun about* 63°: *night,* 58°: *morning,* 53°.

All Odontoglossums of the Alexandræ type should have been repotted, when necessary, by the early part of this month; and all Cool Orchids are materially strengthened by the dewy night air being admitted through the ventilators, which should not be fully closed during this month.

INTERMEDIATE HOUSE.—*Temperature, day with sun,* 70° *to* 75°; *day without sun,* 68°: *night,* 63°: *morning,* 60°.

Many more plants will now be fast approaching maturity, and any Cattleyas which have not completed their growth should now be placed in the warmest part of the house, and those which have finished their growth at the coolest, where a goodly amount of air can be given. The cool night air of September, properly admitted, braces and strengthens all species of Orchids growing in Intermediate houses, their slender pseudo bulbs increasing in sturdiness and plenty of new ones are formed, and the foliage assumes a bronzed appearance or are of an intense green colour. It is as well to defer the use of fire heat until the last moment, 60 to 65 degrees being a good night temperature. Below 60 degrees a little fire heat is necessary.

WARM HOUSE.—*Temperature—this should now be reduced in accordance with the shorter days and colder weather, but give fire heat at night—day with sun,* 75° *to* 85°; *day without sun,* 70° *to* 75°: *night,* 70°: *morning,* 65° *to* 70°.

Calanthes will now be throwing up flower spikes, and a little liquid manure will be beneficial to them, but they should neither be too wet at the root nor too dry. Remove the permanent shading on the glass, and use the roller blind only when necessary; but in giving more light in this way do it gradually, so that no plant suffers by exposure. Such Orchids as Phalænopsis, Saccolabiums, Aerides, &c., will be best in a shady position, as these plants are



often most seriously injured by subjecting them to the treatment given to others. Many more Dendrobiums may now go into cooler quarters, but be careful not to take those requiring a warm winter temperature.

OCTOBER.

COOL HOUSE.—*Temperature, same as last month.*

Fire heat will again be necessary if the nights get too cold, it being best to have gentle warmth in the pipes, and ventilation on, than to have the house shut up without the warmth, as such treatment often produces fungus or mildew in the form of spots on the under surface of the foliage of Odontoglossums, and if not wiped off instantly, a permanent mark in the form of a rusty spot is left. With this warmth, refuse tobacco as before recommended, may be used in the troughs on the hot-water pipes. Roller blinds should now only be lowered when the sun is exceptionally strong.

INTERMEDIATE HOUSE.—*Temperature, same as last month.*

The time has now arrived when water should be given with the greatest care, for I have at times seen plants so shrivelled from drought as to be beyond recovery, while others frequently come under my notice that are suffering from the effects of too much water (*see remarks on* Resting, *page* 50). The roller blind will now be rarely needed, and may be taken down when dry and stored away. A fresh supply of dry leaves should be placed over the pipes or under the stages, as previously recommended; and beware of woodlice and cockroaches, as they are very troublesome at this season.

WARM HOUSE.—*Temperature, day with sun,* 75° *to* 80°; *day without sun,* 70°: *night,* 65° *to* 70°: *morning,* 65°.

Let damping down now be done with discretion, as the air at this season should be kept somewhat drier, the growing period having passed, and the hardening off attended to. I am not advocating such rigorous treatment as [illegible] for the Mexican Orchids, but that a much less moist temperature should be given to others, as well as less water at the roots, and air admitted on all suitable occasions, having a little fire heat to promote a quick circulation and also a buoyant atmosphere, as bracing as possible. With this a healthful tone is given to the plants and is of material benefit to them throughout the winter months. By this means all intermediate second growth is arrested.

NOVEMBER.

COOL HOUSE.—*Temperature, day with sun, 63°; day without sun, 58°: night, 55°: morning, 50°.*

With repotting and top dressing finished, watering of the plants must be done with care, giving only to those which may still be making a little growth, and only now and then to the inactive, sufficient to keep them plump. Now that so little time will have to be spent in watering and damping down, for once or twice a day for damping will be sufficient, according to the fire heat in use, there will be plenty of time for a general cleaning up, washing the pots, thoroughly cleaning the plants, and destroying any insects that may be discovered in their hiding places; the woodwork, glass, and stages must also have attention, clearing away all dirt and rubbish, whitewashing the walls, and making all snug and clean.

Orchids producing flower spikes should be raised above the others by using inverted flower pots, so that they may be easily watched and protected from slugs and other enemies.

INTERMEDIATE HOUSE.—*Temperature, day with sun, 65° to 70°; day without sun, 68°: night, 58°: morning, 55°.*

With increased fire heat now, see that the atmospheric conditions of the house have careful attention. Damp, murky weather at this time of the year should be counteracted by just sufficient warmth in the pipes and house to allow the air admitted through the top and bottom ventilators, both night and day, to be warmed and circulated, unless the outside air is too cold or there is the certainty of frost.

In towns where smoke prevails and when there are fogs, it is best to exclude the outside air at such times, seeing that the plants and atmosphere are not over dry. Afterwards well wash the glass to remove all dirt and to obtain all the light possible, also go over the plants with a sponge to remove the soot, &c., that is deposited on the leaves.

WARM HOUSE.—*Temperature, day with sun, 70° to 75°; day without sun, 65° to 70°: night, 65° to 70°: morning, 65°.*

Now that more fire heat will be needed, see that the atmosphere does not become too dry and arid, and damping down about twice a day. Let any cleaning up also be attended to here, as in the other houses.

DECEMBER.

COOL HOUSE.—*Temperature, day with sun, 58°; day without sun, 53°: night, 50°: morning, 45°.*

During this month a good amount of fire heat will be wanted, but avoid giving it in excess, tempering it as much as possible by damping the house once or twice a day, as may be thought necessary, and ventilating at top and bottom if the outside conditions admit of this being done, especially on the leeward side.

INTERMEDIATE HOUSE.—*Temperature, day with sun, 65°; day without sun, 58° to 60°: night, 58°: morning, 53°.*

See that no Orchid overhangs or shades another, studying which place in the house is most suitable for each plant, and when such a place is found, keep it there until the end of the winter or longer. Damping once or twice a day, as may be found necessary.

WARM HOUSE.—*Temperature, day with sun, 70°; day without sun, 65° to 68°: night, 63° to 65°: morning, 60° to 63°.*

If any ventilation is needed it must be carefully given, avoiding extremes in temperature, and on no account try to force Orchids by a superabundance of heat and moisture. In exceptionally severe weather it is best to keep a covering on the roofs, day and night.



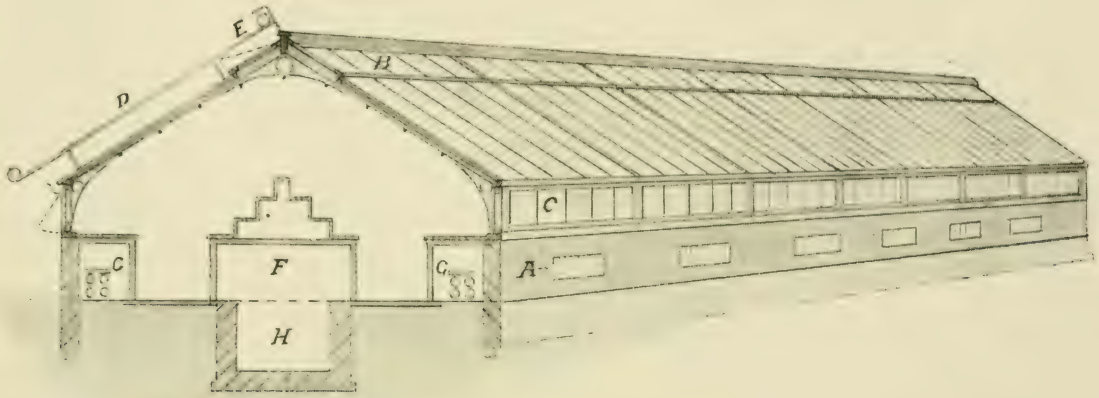
Hints to Orchid Buyers.

The prices hereafter quoted are for good strong healthy plants, with full sized pseudo bulbs, having (excepting where otherwise mentioned) one good growing lead.

The terms "newly imported," "semi-established," or "established" refers to the condition in which the plants may be purchased with good results, that which is placed first indicating the condition most to be recommended. Owing to the risks of establishing newly imported plants they can, of course, be purchased at the lowest prices, as, from some cause or another, they occasionally die; semi-established plants command a trifle higher prices; but if the plants are established, and have bloomed, the price is then, in most cases, fixed according to the character or quality of the flower; sometimes this is above and at others below the average newly imported price.

The prices of Orchids often vary from year to year, and are ruled by the quantities imported, but, taken generally, the prices I have quoted will be fair to both the buyer and the seller, in fact, good reliable plants can scarcely be obtained at a cheaper rate, although advertisements sometimes are seen offering "first-class plants" at much lower prices, statements which should generally be accepted with some reserve.

A MODEL ORCHID HOUSE.



REFERENCES ON PAGES 21, 59, AND 60.

Varieties for Amateurs' Small Collections.

I PURPOSE giving the names of two dozen species, which are good useful kinds for a beginner to start with, and can be cultivated as Cool house Orchids; following on with the same number for Intermediate house culture; also twenty-four of the best for a Warm house. Together with cultural instructions for each sort, which, from my own experience, I have found to give the best results.

COOL HOUSE ORCHIDS.

ODONTOGLOSSUM ALEXANDRÆ. From Colombia.
(*Syns.* O. crispum and O. Bluntii.)

This beautiful Orchid is a great favourite, and was named in honour of H.R.H. the Princess of Wales. Its flowers are white (sometimes rose), marked, more or less, with chocolate blotches, produced on drooping spikes, and when a quantity of plants are grown many varieties are found amongst them, and there are always some in flower, but March, April, and May are the principal months in which they bloom.

Very extensive annual importations of this lovely Orchid take place, so that plants can always be obtained in quantities at a very reasonable price, some of which may prove to be of considerable value, and all are, more or less, beautiful.

Such a compost as that already mentioned on page 29 should be used, and the plants must not be allowed to become too dry during the summer or too wet during the winter. Repot the plants early in spring or the autumn, remembering that they do not thrive with the sun's rays direct upon them and do best when the plants are on the stage, but not far from the roof glass.

Newly imported or established plants are from 3/6, 5/- to 7/6 for strong leading bulbs.

ODONTOGLOSSUM CERVANTESII. From Mexico.

A very neat and pretty little Orchid, which flowers in the winter and remains in bloom for a very long time; growing best in a basket or pan suspended from the roof, and in a compost of peat and sphagnum. It never requires resting, and should always be watered before the compost in which it is growing becomes quite dry. Good, newly imported, or semi-established plants, with three or four leading growths, can be purchased at from 5 - to 7 6.

ODONTOGLOSSUM ODORATUM. From Colombia.
(*Syn.* O. gloriosum.)

This is a very free growing and pretty Orchid, resembling in growth the O. Alexandræ, and this species is also variable, some being exceedingly sweet-scented, while others have but little fragrance. The colour of the flowers range from a ground work of creamy white to clear yellow, all being heavily spotted and barred with rich brown which varies in intensity. The flowers are smaller than those of O. Alexandræ, but the spikes, which are longer, are invariably branched and produce a larger number of flowers; its time of flowering is early spring, and the plants should have the same treatment as the before mentioned species. Good plants can be purchased at from 3 6, 5 -, to 10 6, newly imported or established.

ODONTOGLOSSUM PESCATOREI. From Ocana.

This is a favourite Orchid, flowering almost all the year round, and the blooms are in perfection for a very long time; it is valued for its general beauty and usefulness, and bears its delicate white blossoms on long thin branching spikes; the flowers being irregularly marked with violet coloured spots, and some, purchased as unbloomed plants, are so rich and distinct in the markings as to command high prices. It requires the same treatment as O. Alexandræ, and good serviceable plants, with one lead, can be purchased at from 3 6, 5 - to 10 6, newly imported or established.

ODONTOGLOSSUM TRIUMPHANS. From Ocana.

This is a very showy species, flowering in spring, and the flowers are large, of a bright yellow ground colour, heavily marked with chocolate, contrasting conspicuously with the whiter flowers of those already named. There is great variety also in this species, and those which have broad sepals and petals and well formed

flowers are always in demand. This plant requires the same treatment as O. Alexandræ, and good healthy plants, with one leading growth, should be purchased at from 5/- to 10/6, newly imported, or established.

ODONTOGLOSSUM ROSSII MAJUS. From Oaxaca.

This, although one of the most common, is a very beautiful dwarf growing species, and is imported in large quantities. The flowers are usually of a white colour, much barred and spotted with brown-chocolate, each spike carrying from two to four flowers, varying considerably on each plant, some being small, others much larger; the flowers being well filled up with bright rich colours. Its varieties, "aspersum" and "rubescens," are of greater value, the ground colour of the former being of a clear yellow, and the latter a dark rose. This Odontoglossum does best when grown in a shallow pan or teakwood basket, not too large, and suspended from the roof of the house about 12 to 18 inches from the glass. It should have the same compost and treatment as O. Alexandræ, but the repotting into pan or basket should be done in early spring, seeing that neither are too large for the plant, just leaving a narrow margin betwixt the plant and the outside of the pan or basket. It is a very hardy kind and may be grown in the coolest part of the house, but, being a winter-flowering Orchid, the roots must not be kept too wet during the blooming season. Where a number of plants of it are grown, it may be had in bloom from October until April. Good strong healthy plants should be purchased at from 1/- to 1/6 per leading bulb.

ONCIDIUM MACRANTHUM. From Ecuador.

This Orchid, when in robust condition, is a strong, stately plant, but, like most of the Cool house Oncidiums, the enormous spikes it throws greatly weaken the plant if allowed to remain on it too long, and when it is seen to suffer in this way it is a good plan, in the following year, to pinch out the flower spikes as soon as they appear, thus giving the plant a chance of recovering its strength. The flower spikes of this Orchid grow to a great length, with short flowering branches springing from the main stem, and it is advisable to train it round two or three neat sticks. The colour is golden yellow, with a small portion of purplish brown, and the treatment of the plant should be the same as that recommended for O. Alexandræ, but it may be kept at the warmest end

of the house. Good strong plants can be obtained at 5 -, 7 6 to 10/6 each, newly imported or established.

ONCIDIUM TIGRINUM. From Mexico.

This is another very strong growing Orchid, having larger and rounder shaped pseudo bulbs than the preceding species; it throws branched flower spikes, and the flowers have a beautiful large yellow lip or labellum, the sepals and petals being marked with rich dark brown spots. It usually flowers in October or November, and has a most pleasing perfume, resembling that of the Wild Primrose. The necessary treatment is that recommended for Odontoglossum Alexandræ, but many prefer growing it in a teak-wood basket suspended from the roof; but it also conforms readily to pot culture, and its varieties often differ much in the size of the flower, also in shape and brilliancy of colour. Good strong plants can be purchased at from 5 -, 7 6, to 10 6 per leading growth, newly imported or established.

ONCIDIUM VARICOSUM. From Brazil.

This is another lovely species, the beautiful labellum of which is a rich yellow colour. It has enormous spikes bearing a large quantity of flowers, and when seen in perfection is a most graceful plant. I am, however, unable to recommend it to amateurs so strongly as others, as it sometimes shows deterioration in growth from flowering so freely, still, as it can be purchased at a moderate price, a few plants should be grown, it being easy to give the plant a season's rest from blooming by pinching out the flowers for one year, and so restore it to health again. This Orchid is often grown in pans or baskets, but the best of the good results I have obtained was by growing it on blocks of wood suspended flat-wise from the roof, and if apple, pear, or dogwood blocks are obtainable, they are much to be preferred, especially if newly cut and green, with the bark left on, and the plant securely fastened by means of copper wire and copper tacks. If unable to procure these blocks, the next best are small flat rafts made from teakwood, as these resist decay for a long time. Should, however, decay overtake the block, or slimy matter appear, it will be best to remove the plant carefully and place it on a new one. This is an Orchid requiring but little water, and when grown on wood there is less chance of its being over watered; care must, however, be

taken not to let the plant become dry during the time it is carrying its flower spikes, and it should be suspended near the glass. It blooms about November, and after flowering should be at rest until the spring, only giving enough water to keep it in a plump condition. If on a block or raft, watering once or twice a week will be sufficient; but if in compost, then not so often. Good plants, with two or three leads, can be bought at from 7/6 to 10/6, newly imported or semi-established.

SOPHRONITES GRANDIFLORA. From Brazil.

This little gem is a very small-growing plant, requiring a limited space only, and well deserves a place in every Cool Orchid-house; the flowers are generally solitary, and with never more than two on a footstalk; colour brilliant scarlet, and varying in size according to the strength of the pseudo bulb, the average width of the flower being about an inch. It succeeds best grown in small pans or baskets, and suspended near the glass, delighting in shade it should never be exposed to bright sunshine, and thrives best in peat and sphagnum in equal proportions, with a few small lumps of charcoal to keep the compost open and porous. It should be kept moist all the year through, and does best at the warmest end of the house, or may be removed to the Intermediate house during the winter. Its flowering period is from November to March, and good plants, with from four to five leads, can be bought for from 5/- to 10/- each, newly imported or established.

VANDA KIMBALLIANA. From Burmah.

This is a pretty little Orchid, and does well in a Cool house, suspended in baskets where there is plenty of light, having only just sufficient sphagnum moss about the roots to keep it firm in position. The sphagnum should be kept moist, and the roots luxuriate in a humid atmosphere, but during the winter very little water is required, only sufficient to keep them plump and healthy. It flowers during October and November, and the flowers are white with bright rose. Good plants, with four or five leads, can be purchased at from 7/6 to 10/6, newly imported or established.

MASDEVALLIA HARRYANA. From Colombia.

Rich orange-scarlet, of close dwarf habit of growth. Good plants, having five or six leads, 5 - to 10 - each, established. *See page* 14, "Masdevallias," for culture, &c.

MASDEVALLIA VEITCHII. From Peru.

Another pretty showy species, of close dwarf habit of growth, and of a shining yellow colour, beautifully shaded with purple, and of great substance. Its period of flowering is more prolonged owing to its habit of throwing up flower spikes as soon as new growth is matured, whereas, in M. Harryana, although continually making growth, it pushes up its flowers simultaneously. Nice plants with from two to five growths, can be bought at from 5 - to 10 - each, established. M. Veitchii grandiflora is a specially grand variety.

MASDEVALLIA IGNEA. From Colombia.

A beautiful bright fiery red coloured kind, with the habit of M. Harryana, but the colours do not vary so much as in that species, being chiefly from red or orange to bright red. Nice plants, with from four to six growths, can be purchased at from 5 - to 10 -, established. *See page* 14, "Masdevallias," for culture, &c.

MAXILLARIA GRANDIFLORA. From Ecuador.

This very pretty Cool house Orchid is not grown so largely as it deserves. Its predominating colours are white and yellow, and the flowers are delightfully scented, making a charming button-hole flower. This Orchid grows freely when potted in sphagnum and peat, with a little sand and broken charcoal mixed together. The plants should be placed on the stage and have treatment similar to that advised for the Odontoglossum Alexandræ. It flowers in the autumn, lasting in bloom for a long time, and under proper treatment soon grows into a large plant. Good plants, with one or more strong leading growths, can be purchased at from 7/6 to 10/6 each, established or newly imported.

EPIDENDRUM VITELLINUM MAJUS. From Oaxaca.

This lovely Orchid is a native of Mexico, and is found there at very high elevations, where the atmosphere is constantly moist and cool. The beautiful flowers last in perfection for a long time, and are produced on spikes, which on strong well-grown plants carry upwards of 20 blooms on each, and, when three or four blooms are wired together with fern, are invaluable as button-hole flowers. The colour is bright orange-scarlet, of an uncommon shade. Large quantities of this Orchid are imported

annually, and it is evidently very plentiful in its native habitat, and is of easy culture in pots or on suspended fresh blocks of wood, but I recommend pot culture. Potting and treatment of this plant should be the same as that recommended for Odontoglossums, only that the coolest part of the house suits it best, for, like Odontoglossum Rossii majus, it will stand severe cold better than many Cool Orchids, and its usual time of flowering is from May to August. The best time for repotting it is March, not allowing it to become dry afterwards, or the flower spikes, which commence pushing at this time, may be weakened. Good strong plants are obtained at about 1 6 per leading growth, and the majority of the clumps as imported have an average of four to five leads, so that they are serviceable plants to start with, newly imported or established.

Disa grandiflora (*the Flower of the Gods*).
From the Cape of Good Hope.

This is a tuberous-rooted herbaceous Orchid of great beauty, when properly cultivated, and is a native of the Table Mountain, at the Cape of Good Hope, and, although requiring a somewhat different treatment to most of the Cool house Orchids, it is one that I feel constrained to recommend to amateurs, as the treatment required is so simple. It should be potted in chopped fibrous peat, with a liberal supply of coarse silver sand, filling the pots one quarter of their depth with crocks, and placing over them a thin layer of sphagnum, making the tubers moderately firm in the pots, and leaving their crowns slightly below the surface of the soil. The best time for repotting them is in the autumn, immediately after the plants have flowered, when a new growth starts from the side of the old flower spike. During the winter months Disas should occupy an airy position in a Cool house, or a place may be found for them with the Odontoglossums on a shelf near the glass, at the coldest end if possible, and near to a ventilator. In April they should be removed to a cool frame, having a north aspect, which is, or can be, shaded from the sun's rays, and the plants should be well syringed night and morning and never allowed to become dry. They should also be examined occasionally for red spider and aphis, which sometimes attack the plants. Under such treatment as I have recommended Disa grandiflora will grow freely and multiply, and the great beauty of its flowers

will be seen from September to October. The colour is a rich scarlet, tinted rose, with white markings, and strong plants can be purchased at about 5 - each, established or newly imported.

Dendrobium Jamesianum. From Moulmein.

There are but few Dendrobiums which can be cultivated with much success in a Cool house, but this species is suitable, and when well grown is a stately Orchid, producing fine trusses of large and beautiful white and yellow blooms. The usual compost I have recommended for Orchids suits it, and it can be grown in small baskets suspended from the roof, near to the glass, and have plenty of water when growing, and during the winter it should never be allowed to become dry enough for the pseudo bulbs to shrivel. Strong plants, with one lead, are obtainable for about 5 - to 7 6 each; and, in purchasing this Orchid, it is best to obtain newly imported or semi-established plants, as they start into growth much more satisfactorily than old plants.

Cypripedium insigne. From Nepaul.

This old species of the "Lady's Slipper" is a great favourite, and is found in almost every collection of plants in all gardens of note throughout the country, and, like Cœlogyne cristata and Dendrobium nobile, it should be grown in pots in a compost of fibrous peat, broken charcoal, silver sand and sphagnum moss. The pots should be well drained to half of its depth, using pieces of broken pots and large pieces of charcoal with a layer of sphagnum over the drainage. In potting, let the compost be well worked in amongst the roots and around them, making it moderately firm, and watering carefully until the plants are established, then they luxuriate especially in the growing summer season in a liberal supply of water. It is a very free blooming plant, throwing its flowers in great numbers when the roots are pot-bound, but not so large and of such good quality as when the roots have more freedom, and they do best on the stage, near to the glass, and where there is as much light as possible. The flowers are of a pretty greenish yellow colour with white markings. There are now many varieties of Cypripedium insigne, such as Chantini, a bold form, and one of the best, and moderately cheap, fully half of the dorsal sepal being white, beautifully spotted with purple. There is also a handsome clear straw coloured variety named Sanderæ, but it is

exceedingly rare at present. Strong established plants of this variety (insigne), capable of carrying five or six blooms, can be purchased for 7/6 or 10/-; smaller plants can be bought much cheaper.

CYPRIPEDIUM VILLOSUM. From Moulmein.

This is another beautiful Cool house Orchid, requiring the same treatment as C. insigne; it is rich in colour, but of peculiar shades of light and dark rich brown combined with soft green and purple, the flower having a beautiful shining appearance as though it had been varnished. It flowers in spring, and good plants, capable of carrying three or four flowers, can be purchased for 10/6.

CŒLOGYNE CRISTATA. From Nepaul.

This should be in every collection, however small, for it is exceedingly beautiful, blooms very freely, and is so easily cultivated. The flowers are pure white, with a small yellow blotch on the labellum, and are borne on pendulous racemes, with frequently from six to eight flowers on each, when the plants are strong. It must, however, be admitted that it seldom flowers so abundantly until the plant has reached a fair size, although it is no uncommon occurrence to see in Orchid houses large specimen plants smothered with flowers, almost entirely hiding the foliage. Small plants will sometimes flower freely, but not in proportion to the old established clumps, which have many more leading growths to produce flowers. Do not, therefore, disturb the specimens until it is desirable to increase the stock, as considerable time elapses before growth commences, and activity of the pseudo bulbs takes place. This is somewhat surprising, seeing that the plant makes so little root compared with many others. It is consequently better not to repot this Orchid until absolutely necessary, which is, when growing over the side of the pot, when, however, repotting has become imperative, the division of the plant should be avoided as much as possible, as it thrives best when having a mass of bulbs, and it delights in a liberal supply of water during the growing season, but after the growth is completed the plants should be kept in a dry position and in the most airy place in the house, and only a little water given occasionally. A cool, dry greenhouse, with a temperature as low as 40 degrees at night, would suit it during winter. If too much water is given just before the buds appear,

the flower spikes are apt to turn black and rot off. The proper compost for this Orchid is sphagnum and peat in equal proportions, and the plants flower in March and April. Manure water may be applied during the growing season, but in a weak form. Good plants, capable of bearing from four to eight spikes, can be purchased at from 5 - to 10 - each, and large specimens can sometimes be met with at very moderate prices, established.

CATTLEYA MARGINATA. From Brazil.

(*Syn.* C. pumila.)

This is almost the only Cattleya that will grow well in company with Odontoglossums; it is a dwarf-growing species and should be grown in baskets in the usual compost of peat and sphagnum, and suspended as near the glass as possible where there is plenty of light and in the warmest position. It should be kept moist when growing, but after flowering but little water is needed during the winter– its blooming time is usually October. Like other members of this genus it is subject to mealy scale on the rhizomes and psuedo bulbs, but this can be kept down by occasionally going over the plants and cleaning it off with a small brush, taking care not to bruise the dormant eyes. The flowers are rose-coloured, and may be mistaken, as in fact it sometimes is, for Lælia Dayana (*syn.* Lælia prestans), but Cattleya marginata has the boldest flowers, and the lip is margined with a white tint. I recommend newly imported or semi-established plants being obtained, as old established plants are not so satisfactory. The price of plants vary from 5/- to 10 -, with from three to five good leads.

ANGULOA CLOWESII. From Colombia.

This is a noble free growing Orchid, and peculiarly interesting on account of the bold beautiful yellow and highly perfumed cup-shaped flower, the labellum of which moves up and down in a rather eccentric manner when the flowers are touched, being delicately connected by a thread-like ligament, and is known as the Cradle, also the Tulip Orchid. This plant grows best in a pot, and the compost should consist of two parts of peat, not necessarily very fibrous, to one of sphagnum; it flowers in May or June, and the plant commences its growth simultaneously with its flowering. Should it be necessary to repot the plant, it must be done when the flower spikes begin to appear, generally in the early part of

March, for if left until they are out of bloom both the new growth and the new roots are very far advanced, rendering repotting at that stage both difficult and dangerous. During the growing season water may be given rather freely, but when a new pseudo bulb has completed its growth it should have a good period of rest, giving but little water during the winter, and the plant should occupy a position on the stage near to the glass. Strong plants may be purchased at from 10/- to 20/- each, established or semi-established.

ADA AURANTIACA. From Ocana.

This Orchid is recommended on account of its beautiful orange coloured flowers, many of which are produced on each spike, a few plants in flower being very effective when arranged with other Orchids. It flowers during the early spring months, and requires the same treatment as the Odontoglossums, though probably a little less water is required during the summer months, and it should occupy the warmest end of the house, as its leaves become spotted on the under surface if the temperature falls very low, and this should be avoided if possible, as such a check often produces disease, seriously injuring and occasionally causing the loss of the plant. Good plants, which under generous treatment soon grow into good specimens, can be purchased at from 5/- to 10/6 per two or three leads.

TWENTY-FOUR ORCHIDS FOR AN AMATEUR'S INTERMEDIATE HOUSE.

All Cheap, Beautiful, and Easily Grown.

CATTLEYA AUREA. From Antioquia.

This is the most beautiful of all the Cattleyas, having rich golden-yellow flowers, with lovely purplish crimson veined markings on the lip—a charming and attractive combination of colours. It requires a little more warmth than most of the other species, but the beauty of the flower amply repays a little extra trouble; and, if available, a position near the glass and immediately over the end where the hot-water pipes enter the house, would suit it admirably during the growing as well as the resting season. This grand Orchid should be repotted into pots or baskets,

in fibrous peat and sphagnum, about March or April, as it then commences to grow and push out new roots. Water moderately at first.

All through the summer months, whilst the new pseudo bulbs are in course of formation, the plant should not be allowed to suffer from drought, but watered when the compost assumes a whitish appearance. When the new growths have reached their normal size, the bloom buds begin to form and push, by degrees, from the sheath, and open during the months of September and October. But, like some others, this Orchid will occasionally push up its flowers from the apex of the pseudo bulb without the presence of the sheath; whilst, on the other hand, a sheath may be formed and a flower fail to come. But these are exceptions and not the rule. It sometimes happens that autumn-flowering Cattleyas, instead of pushing up their flowers, start a young growth from the base of the newly-formed pseudo bulb, and in such a case I always pinch off the new growth to induce the flower to form and open in due course. If, instead, the young growth is allowed to remain, it rarely develops a full-sized, strong pseudo bulb, and the autumn is far advanced before the growth is even matured, and all hope of seeing the bloom grow and expand may be abandoned. After flowering very little water is required, only enough to keep the bulbs and leaves healthy and plump; probably once a week will be sufficient, always taking care that the plant is in a warm and dry position during winter. When the flower spikes have been cut, the sheath should be entirely removed by pulling them clean away from the pseudo bulb, and all danger of damping or decaying will thus be arrested. Strong plants, newly imported or established, at from 10/- to 20/-.

A variety named C. Dowiana is very similar, but is not such a free bloomer.

Cattleya labiata Gaskelliana. From South America.

This is a late summer blooming species, producing its flowers during the month of August and the early part of September, and should be potted in March, just as they commence making their growth, or may be left until after the plants have flowered. Fibrous peat and sphagnum in equal proportions, with a little broken charcoal mixed in suits this and all other Cattleyas, and the pots should be well drained half their depth, placing large crocks at the bottom, and smaller with some charcoal over them. Cattleyas

should be potted moderately firm, bringing the new compost well to the base of the pseudo bulb, and, when potting is completed, should any portion sway, steady it by tying the pseudo bulbs to neat sticks, it being so necessary to the roots when pushing to take a firm grip of the compost, which is prevented if the plant is unstable. There are numerous varieties of C. Gaskelliana, varying more or less in shades of colour and markings, light tinted forms predominating, so that the darker varieties are in greater demand; also those which are almost white, but very few pure white forms have yet appeared. These can all be grown in pots or baskets, and should have a position where there is much light, but shaded from the hot sun. This is a somewhat plentiful species, and good strong plants can be bought for 2/6 per leading growth, so that plants suitable for a 32-size pot with three or four leads may be bought for 10/6. Watering should be attended to as recommended for C. aurea, and a good supply given when the plant is growing, but only sparingly when at rest. Newly imported or established.

CATTLEYA LABIATA GIGAS. From Antioquia.
(*Syn.* C. Warscewiczii.)

This is another superb summer-flowering species, blooming immediately the pseudo bulb is formed, and some of its varieties, known as Sanderiana, Imperialis, Burfordiensis, &c., have blooms of a great size and brilliancy of colour, but, if recently imported, these varieties cannot be determined until they have bloomed. Cattleya Sanderiana is really a very fine form (or variety) of C. gigas. Imported plants of this splendid Orchid are sometimes sold by auction, under the name of C. Sanderiana, but, as previously stated, their identity cannot be established until they are in flower. There are varieties of this species which are naturally shy bloomers whilst others flower very freely, but whether shy blooming or otherwise, they flower much more abundantly if grown near the glass, and almost fully exposed to the sun's rays, only shading them when the sun is intensely hot and bright. This species can be grown in pots or baskets, in peat and sphagnum, and are best repotted either in March, just as they commence growing, or in the summer, immediately after flowering. I prefer summer potting, as then the new pseudo bulbs push out a number of fresh roots which continue growing more or less through the winter, and the plants at this stage become quickly re-established in the new compost.

There is some danger of this species starting into growth again, more especially if the pseudo bulbs do not bloom, and it is not always possible to prevent this, but it can generally be avoided by reducing the amount of water and giving the plant an airy and dry position throughout the summer—the coolest in the house, near to a ventilator, if possible, or it may be placed in an early Peach house, or early Vinery, after the fruit has ripened, and the trees are at rest—and restored to their proper quarters by the end of October, where they should remain dormant until March, giving them very little water, and even when they start into growth in the spring, water should be given very sparingly until the new growth is about two inches long, but after that more freely, remembering that if too much water is applied at the early stage of growth the chances of the plant flowering freely are greatly reduced. The colour of this species is of a beautiful rose tint varying in intensity, the lip is very handsome, being much darker, with a large yellowish blotch in the throat.

Good plants can be obtained, with one or two leading growths, at from 5 - to 10 6 each, newly imported or established.

CATTLEYA LABIATA VERA. From South America.

This, also, is a beautiful and useful species and a very free bloomer, opening its lovely blossoms during October and November. It is a very old introduction, having been brought into this country in 1818, but until within the last four years it was rarely seen in flower, and this is accounted for by the original importations being so very small. For many years no plants reached this country until when recently rediscovered and introduced in very large quantities; while, owing to its scarcity previously, it is looked upon as a valuable addition to this grand labiata section of Cattleyas. There is great variety amongst them—some being small and deficient in colouring, the flowers of others being as large as C. gigas and dark mauve in colour, with the lip of a rich purple tint. Strong plants of this species may be purchased at from 5/- to 10 6 each, with from one to three leading growths—plants which four years since would have cost from £40 to £50. It is best grown in pots or baskets, and occupying a position where there is plenty of light. Its treatment should be the same as that advised for C. Gaskelliana. Newly imported or established.

CATTLEYA LABIATA MENDELLI. From South America.

Another variable family of great beauty, having very large, handsome, and often exceedingly delicate tinted blooms, the sepals and petals frequently being of a light pink shade of colour, often approaching to white. It flowers during April or May, and does best when grown in peat and sphagnum, either in pots or baskets, in a light position near the glass, and should be potted immediately after flowering only. For general culture and treatment, see that recommended for C. Gaskelliana.

Good plants can be obtained at from 5/- to 10/- each, newly imported or established.

CATTLEYA LABIATA MOSSIÆ. From Caracas.

This also is a very beautiful Orchid, and richly deserves a place in every collection, the labellum or lip is so richly and beautifully coloured, while the plant is of easy culture and blooms very freely from April to the end of June. It should be potted immediately after flowering into pots or baskets, using peat and sphagnum, watering freely during growth. It is advisable to keep it moderately dry whilst at rest; but, like others, must not become thoroughly dry when in flower. Good plants, with from one to four breaks, can be purchased at from 3/6 to 10/6 each. As with other species of Cattleyas, there are several varieties, many of them distinct and richly deserving a place in every good collection, especially such as C. Mossiæ Wagneri, pure white with an orange blotch in the throat; C. Mossiæ Reineckiana, with pure white sepals and richly marked lip. These Cattleyas should occupy a position near the glass, and be potted immediately after flowering only. For general treatment, see C. Gaskelliana. Newly imported or established.

CATTLEYA TRIANÆ. From South America.

This species is one of the earliest to flower, commencing in January and continuing through February and March. The good varieties of this species are equal in size and beauty to any of the C. labiata section, but there are a large portion of the varieties with smaller blooms, and although all are very pretty and their colours varied, from delicate pink to rich dark rose, they are not equal in size and form to the finest of the labiata section. There are also several named varieties of this species, such as C. Trianæ

alba, with pure white sepals and petals with yellow on the lip, which is an expensive variety, but plants are sold under this name which are not pure white but have a faint tint of pink colour, this colouring matter varying according to the season, sometimes almost pure in colour, at other times the rose colour is more noticeable, and occasionally more like a variety sold under the name of Cattleya Trianæ delicata. As this species comes early into flower, it also commences making new growth, and matures sooner than C. Mossiæ and C. Mendelli, and like C. gigas, it is best to be watchful, to prevent a second growth. Pot after flowering only. For other treatment, resting, &c., refer to C. Gaskelliana, page 95.

Good plants of this species can be purchased at from 5/- to 10/6 for plants with from one to three strong leads, newly imported or established.

Cattleya labiata Schrœderæ. From Colombia.

I have already given a long list of C. labiata varieties, but cannot omit mention of this beautiful kind, which is distinguished from the other species of C. labiata on account of the flowers being more constant in form and colour, and although varying in hue to some extent, scarcely ever assume the wide differences in colour and form so characteristic of the other species. The flowers are of a beautiful and uniform delicate rosy blush tint with a large blotch of orange-yellow in the throat; a lovely and chaste variety, and should be included in every collection. In growth it much resembles C. Trianæ, and can be grown in pots or baskets, having the same treatment as recommended for that species.

Good plants can be purchased for from 5/- to 10/-, with from one to three strong flowering leads. Newly imported or established.

Cattleya Loddigesii. From Brazil.

A very pretty species, and one which well deserves a place in all collections. In habit it differs from the foregoing, but requires exactly the same treatment, and it may be grown in either pot or basket, but owing to the pseudo bulbs growing longer than others, it is most adapted to pot culture. It should be repotted in early spring, just as the new growth and roots push forth. It flowers from August to October, lasting a long while in perfection, the spikes bearing flowers according to the strength of the plant, and

are of a rose colour, with a small blotch of light yellow on the lip. A variety known as C. Harrisoni is very similar to this species, the flowers being darker in colour with the blotch on the lip of an orange colour. Peat and sphagnum is the best compost in which to pot this plant, and as to general treatment, see that recommended for C. Gaskelliana, giving it a position where it can have plenty of light.

Good plants of this species should be bought for about 5/- for one or two strong leading growths. Newly imported or established.

CATTLEYA CITRINA. From Mexico.

This is totally unlike any other species of Cattleya in growth and habit, and is one of the very few Orchids which I recommend for block culture because of its habit of growing downwards, the pseudo bulbs, foliage and flowers always drooping towards the ground. If the plants when first received from the importer were placed on a block or in a pan in an upright position—which to an inexperienced person amongst Orchids may be thought to be its natural one—the first new growths formed would turn and grow in an opposite direction. This Orchid appears to be most plentiful in its native habitat, as it is imported in large quantities, and this is a very fortunate circumstance, for without new supplies it would in a few years become very scarce, as it is one of those kinds which deteriorate after about the third year. Some growers cultivate it better than others, and keep it in good condition a longer time, but I have never heard of anyone hitting upon the exact treatment that would keep the plants in a permanently flourishing condition and give an increase in size. It is a handsome Orchid well worth growing and renewing the stock occasionally, and should be grown on a block as advised for Oncidium varicosum on page 87; suspend it in a light position and water when dry, by dipping the block and plant into water for a few moments, once every evening if the weather is very dry or hot, and keep at the warmest end of the house in winter time. The flower is of a beautiful bright yellow colour, deliciously fragrant, and the plant always grows actively during the winter, flowering from April to June, and when in flower should be watered without immersion or the flowers will at once decay.

Nice little clumps range from 2/6 to 10/6, for from one to three leading growths. Newly imported in spring.

CŒLOGYNE MASSANGEANA. From the East Indies.

This is a free growing Orchid and very floriferous when the plants are strong, producing its spikes freely. It should be grown in peat and sphagnum, and is best suited for a basket plant, as the flowers are borne on long pendulous spikes from 12 to 24 inches long, sometimes bearing as many as twenty-four flowers on one spike, and when these are drooping over the side of the basket the plant has a very pleasing appearance, although void of any brilliancy of colour—light yellow and brown predominating. This Orchid should have liberal supplies of water when actively growing, and when inactive it should be kept moderately dry, but never dry enough to cause the pseudo bulbs to shrivel.

Good plants should be purchased at from 5 - to 7 6 per strong leading growth. Established.

CYMBIDIUM EBURNEUM. From the East Indies.

Another free growing Orchid, and, like the last named, it soon grows into a large specimen when the surrounding conditions are favourable, and when they become large plants they flower much more freely than when small. It is best grown in pots, in stiff fibrous loam and peat in equal proportions, intermixed with sharp silver or river sand and a little finely broken charcoal to keep the soil sweet and porous. The pots should be a third full of drainage, and not too small, for if the large fleshy roots of this species are too cramped it is impossible to work the soil down between them, and they must be made moderately firm, otherwise the roots will be crowded into the pots in a mass with no soil worked in between them, but only about them, in which case they invariably rot. The surface of the soil should not be above or even level with the rim of the pot, as is recommended for epiphytal Orchids, or the water runs off instead of into the plant. There should at least be half an inch of space below the rim to receive water. The flowers are borne singly or in pairs, and are a beautiful pure white, with a slight streak of yellow on the lip, and are very sweet scented. It should be watered only when dry, like an ordinary plant, and will succeed best in a cool, shady part of the house, where, if due attention is given to the watering and potting, it soon grows into a

good specimen plant, and the stronger the growth the more freely it flowers.

Good plants, capable of producing from four to six flowers, can be purchased at from 10/- to 20/-. Established.

CYPRIPEDIUM HARRISIANUM. Garden Hybrid.

A very free growing and floriferous Lady's Slipper, which should be potted as recommended for Cypripediums (*see page* 30), and given a place in a somewhat shady and moist part of the house. It delights in plenty of water at the root during the summer, but during the winter months it must have only a moderate supply, yet never allowing it to become too dry. In the flower there is a mixture of rather dark colours, claret and dark purple predominating, and it is a hybrid between C. villosum and C. barbatum, the flowers having the glossy surface found in C. villosum, and is in flower during the summer months.

Strong plants should be bought at from 5/- to 7/6, capable of bearing two flowers.

CYPRIPEDIUM SPICERIANUM. From Assam.

This also is a very pretty species, and was, until recently, very rare and expensive, but lately, owing to large importations coming to hand, it can be purchased at a moderate price. It requires exactly the same treatment as the foregoing Cypripedium, and, like that species, cannot bear strong sunshine. The beauty of the flower is chiefly in the dorsal sepal, which is for the most part white, with a purple stripe running through the centre, the petals of a greenish colour, and the lip or pouch brownish purple, and it flowers from October to December. Some cultivators habitually grow this species in a very cold place, but I have found it to do best in the Intermediate house. It is not, perhaps, such a free grower as some, and does not grow into large specimens so rapidly, but, with proper attention, is not at all difficult to cultivate.

Good serviceable plants should be purchased at from 5/- to 10/-, capable of bearing two or three flowers. Established.

ODONTOGLOSSUM CITROSMUM. From Mexico.

(*Syn.* pendulum.)

This is a beautiful Orchid and should be grown by everyone, its cultivation being so easy when rightly managed. It should be grown in pans or baskets, in one part sphagnum and two parts

lumpy peat, and made secure from shaking about until it has rooted firmly, and the pans or baskets suspended from the roof. This Orchid suffers much from being disturbed, therefore, it should not be shifted into larger pans or baskets more than once in four or five years, supposing the leading pseudo bulbs are not gowing over the side. After it has been shifted into a larger sized pan or basket, it should be kept in a shaded place until re-established to some extent, and during its growing season in summer it should be kept moist at the roots until its growth is completed (and this will be about October), after this it should be gradually dried off by giving a lesser supply of water, until about the end of November, keeping it very dry during the remaining part of the winter in order to ensure flower spikes, which grow from the centre of the young growth in March and April. If the plant is kept moist from November until March, probably no flower spikes will appear. It should be allowed to get dust dry before giving it water, even if the pseudo bulbs shrivel a little, as this will do no harm providing excessive shrivelling is avoided. It is difficult to state exactly how often to water this Orchid as so much depends upon the state of the weather, sometimes once a week will suffice, at other times once a fortnight. It should be grown at the coolest end of the house and will enjoy as much light as Cattleyas generally require, too much direct sunlight upon the plants being most fatal to them. Supposing the new pseudo bulbs to be of a fair average size the plant may reasonably be expected to flower with such treatment, and the spikes will, as before stated, appear from the centre of the young growth about April, and these should be protected from slugs or woodlice by wrapping a piece of cotton wool round the growth, and after the spike has appeared the plant may gradually receive a larger supply of water; should the spikes not appear, however, by the end of April, and the tips of the new leaves become visible, with the new growths extending, it shows that in all probability there will be no flowers that season, and the plant may then be watered and grown on accordingly for another year. The flower spikes should not be tied in an upright position to sticks, but allowed to take their own course and drooping downwards; the colour is white, more or less tinged with rose, and varieties frequently produce blooms with the lip of a beautiful dark rose colour.

Good plants of this species should be purchased at from 3/6, 5/- to 7/6 per leading bulb for newly imported or established plants.

DENDROBIUM THYRSIFLORUM. From Moulmein.

There are not many of the family of Dendrobes which can be said to grow thoroughly well in an intermediate temperature, this however is one of the exceptions, but, coming as it does from a hot climate, it should be placed at the warmest part of the Intermediate house. It is generally grown in pots, and can also be cultivated in baskets, but is an Orchid which does not like disturbance at the root, still repotting becomes necessary sometimes, it being safer to err on the side of repotting too often than to allow the roots to perish in decomposed material. It should be potted in good fibrous peat and sphagnum in equal proportions, half filling the pot with drainage, potting moderately firm but not to cover the base of the pseudo bulb, yet bringing the compost well up to the base, so that the young roots enter the compost when immediately pushing into growth. When repotting, all dead or decaying matter should be removed from the roots, and the live roots carefully handled and evenly distributed in the new pot. This operation should take place in spring, directly the plants have finished blooming, which is generally in April, after which time the plant should be encouraged as much as possible to make new growth by being placed in a shady position and very gently damped over with a syringe once a day. The new compost must be kept just moist only, and on no account should it become saturated until the summer is further advanced and active growth sets in. It is always an important point in repotting Orchids to use a few neat sticks firmly fixed into the crocks, to which some of the pseudo bulbs can be tied, in order to make the entire plant secure and not shake about in handling the pot, or it does not readily get re-established. This Dendrobe does not last long in flower, but the grower is amply compensated by the great beauty of the flowers, which are white and yellow, and borne on drooping racemes. When in a growing state, this plant requires a reasonable amount of water, and as it is an evergreen kind it does not require so much rest as most of the other kinds of Dendrobiums during winter, and when kept in a dry state it should never be allowed to shrivel on any account, and kept at the warmest end of the house and well up to the light. Yellow thrip are sometimes troublesome on this species but may be kept down by sprinkling or puffing tobacco powder down the new growths and over the foliage, and should they make too much headway, then resort to fumigation also.

Good established plants of this Orchid should be purchased for about 5 - per leading growth, but I recommend purchasing newly imported plants which have arrived in the spring, such plants are likely to give much greater satisfaction, and they should then be purchaseable in extra strong pieces at from 3 6 to 5 - per leading growth.

Lælia anceps. From Mexico.

This is a very lovely and easily cultivated Orchid which comes into flower in November and December, producing freely flowers of a charming rose colour, with the labellum richly coloured and much darker than the sepals and petals—in short, the colour varies from light rose to very dark rosy crimson, and the most valuable of the varieties, excluding the white, are those which are very dark in colour.

This Orchid may be grown in pots on the stage or in baskets suspended from the roof, and they should be repotted during the month of March, using peat and sphagnum in equal proportions, first half filling the pot with drainage and keeping the compost moist, but not too wet, for about five or six weeks afterwards, when they can be watered more freely; in fact, well soaked by dipping in the tank, especially when the sphagnum has a whitish appearance. When the growth is finished in the autumn, watering may be again reduced, but the plants must not be allowed to suffer from drought until they have finished flowering, then only enough water is required, until March, to prevent shrivelling.

If it is possible to give a small portion of the house full sunlight by not shading it, but not allowing other plants to suffer, this Orchid really thrives better if fully exposed to the sun with plenty of air than it does when too much shaded, and it also flowers more freely. Plants may be purchased either established, or newly imported, but I prefer the latter, always selecting those masses which have good foliage, for a loss of leaves means a proportionate loss of strength, which materially affects the vigour of the plant when making new growth. When repotting newly imported plants a large portion of their roots should be rather severely cut away—of course using discretion in doing so—as they only take space which good compost should occupy, and in a short time would become a mass of wet and cold decomposed matter.

Plants may be purchased for about 3 - per leading growth, or about 10 - for masses having probably five or six leads.

LÆLIA AUTUMNALIS. From Mexico.

This is another very pretty species and of very simple culture, but it has a reputation for deteriorating, which is certain to follow if wrongly cultivated, whereas, if hardened at the proper season, it will last in good condition as long as any other Orchid and flower as freely. It flowers in November and December, is very similar in habit and general requirements to Lælia anceps, and if treated in the same way will take no harm. I would advise, however, that it be always grown in a hanging basket near the glass, giving the plant the full benefit of the bright sunshine whenever possible. After the flowering an absolute rest should be given, but not so as to cause shrivelling, and at that period it is capable of withstanding a low degree of temperature, and will endure cold or direct draught better than most Orchids. Plants should be purchased at about the same price as quoted for Lælia anceps, but good newly imported plants with good foliage are best.

LÆLIA PURPURATA. From St. Catherina.

This is a noble growing and fine Orchid, in appearance very much like a Cattleya, indeed, there is so little difference between Cattleyas and Lælias as to sometimes cause surprise that they are not included in one group. There is, however, a botanical distinction, consisting of the Cattleya having four pollen masses, while the Lælia has eight.

This species (L. purpurata) is best grown in pots half filled with drainage, and potted in peat and sphagnum in equal proportions, and after being repotted it is apt to shrivel a little, but with just ordinary care it soon becomes re-established and grows very freely. No better place can be found for this plant than on the stage and well up to the light, watering and treating exactly the same as a Cattleya. It differs slightly, however, inasmuch as it is rarely ever at rest, growing during winter as well as in summer, and has therefore no definite resting season. Its time of flowering is May or June, and the varieties vary very much in colouring, some being particularly dark and others almost a pure white, all being well worth growing.

This species may be purchased either as newly imported or established plants, but a nice healthy established plant is perhaps to be preferred, as, unless Lælia purpurata is imported in first-rate

condition, a year or two must elapse before strong flowering growths can be made. On the other hand, newly imported plants can be purchased at a much cheaper rate.

Healthy established pieces should be obtained for from 5 - to 7,6 per strong healthy growth, whilst newly imported pieces can usually be bought for 3 - to 5 - per leading growth.

Lycaste Skinnerii. From Guatemala.

A very lovely winter-flowering Orchid, the flowers of which are of large size, of a thick wax-like tendency, and are borne on erect footstalks. There is considerable variation in the colouring, the light or delicate forms being mostly admired, the sepals and petals of which are of a beautiful blush white. Lycaste Skinnerii alba is a pure white variety and very handsome, and much more expensive on account of its rarity. L. Skinnerii should be grown in pots half filled with drainage, using peat and sphagnum in about equal parts, and although I do not recommend a bad quality peat to be used, still it need not be of the best fibrous quality for this species. The plants should be repotted in early spring, only doing this when really necessary, say once in two or three years. Some growers use a little fibrous loam in the compost, which may do good, but, generally speaking, I do not regard it as necessary, success in cultivation depending in a much larger degree—as with all other Orchids—upon temperature, atmosphere, watering, and general attention.

I have found that every care must be exercised in watering this species, and it is much safer to give too little than too much moisture, even when the plant is in active growth during the summer watering must be very carefully done so as not to get the compost soddened, which causes spot to appear both in the leaves and pseudo bulbs, and this is generally known as disease.

Established plants, if healthy, of this species may be purchased, but those which prove most satisfactory are newly imported or semi-established plants, as they always grow more freely. The flowers appear from the base of the newly made pseudo bulb during the autumn or early winter months, according to the health or strength of the plant. This is a deciduous species, losing its leaves in early spring.

Plants may be purchased from about 3 - to 5 - per leading growth.

MILTONIA VEXILLARIUM. From Antioqua.
(*Syn.* Odontoglossum vexillarium.)

This, when well grown, is one of the most showy and beautiful of Orchids, and if cultivated under proper conditions makes rapid growth, but with unsuitable treatment it presents a very unsatisfactory appearance. In the Intermediate house, however, it grows without difficulty, and it should be repotted after flowering, generally about the end of May, and once in two years is often enough for doing so. After repotting, water very carefully, keeping the compost just moist and the plants a little more shaded for five or six weeks, after which water may be applied with greater freedom; although, as in the case of Lycaste Skinnerii, it is always best to have the plant kept in too dry a condition rather than too wet, especially during winter, and should there be any doubt as to the plant wanting water, wait a day or so until quite sure on this point. The points of the leaves of this species have a peculiar habit of decaying, especially under wrong treatment, either from being too wet at the roots or from too cold a temperature, and this indication commences at the apex by the formation of a watery spot, which should be pierced with the point of a knife, or cut clean away, otherwise it extends in a downward direction. The yellow thrip is a natural enemy to this plant, and if allowed to ravage unimpeded soon work great destruction, but they are easily exterminated by dusting tobacco powder down the axils of the new growth. It thrives best when grown in pots, which should be placed on the stage at the warm end of the Intermediate house and well up to the light, or it may also be suspended in a light and airy position, but not in a direct draught from the ventilator, but where there is a free circulation of pure air, with treatment as before recommended, then free growth is generally assured to this beautiful Orchid.

The best potting material is sphagnum moss and fibrous peat, in equal proportions, with a small quantity of small broken knobs of charcoal mixed in. A variety named "rubellum" has small flowers and blooms at a later date, but is by no means so pretty as the original species, M. vexillarium, which also varies in form and colour in different plants; the almost white, as well as the darkest and richest coloured being the most valued. A little weak manure water is beneficial during the growing season. This plant is best

purchased in an established state, as it is found difficult to import it in good condition, and two years are generally required to get such plants established.

Good strong plants can be purchased at from 5 - to 7 6 per leading growth.

SOBRALIA MACRANTHA. From Guatemala.

This is a very handsome free growing species, and a healthy plant, properly treated, soon grows into a large specimen, producing a number of flowers. It is best grown in a pot, which should be drained with rough crocks to one-third of its depth, and over this a thin layer of sphagnum, and good strong turfy loam, adding a little coarse sand and broken charcoal, to ensure a porous compost and drainage. It should be potted as recommended for Cymbidium eburneum, leaving the surface of the soil one inch below the level of the pot to provide for a thorough watering, and, in potting, the compost should be made moderately firm. This plant is always in a growing state, therefore, has no resting season, and simply requires a good watering when it becomes dry, as with an ordinary greenhouse plant. It should be kept in the coolest part of the house, well up to the light when it can receive a good supply of air. The Sobralia flowers during May and June. Each stem, which is rather tall growing, bearing in succession from five to eight beautiful large rosy purple-tinted flowers, and the plant does not need repotting until the pot becomes overcrowded with roots, then it should be turned out and all the old crocks removed, together with as much of the soil as can conveniently be taken away without disturbing the roots, and then repotted into a larger pot, and when the plant is re-established a little weak manure water is beneficial.

Established plants of this species should be purchased at from 10/- to 21/- for two or three flowering stems.

THUNIA MARSHALLIANA. From the East Indies.

This is another handsome free growing Orchid, bearing a large truss of beautiful white and yellow flowers at the top of the new pseudo bulbs in June or July. This species has a very short season of growth, and should be cultivated in pots half filled with drainage and potted in a mixture of peat, loam, and silver sand, and the compost left quite half an inch below the rim of the pot. The

proper time for repotting the plant is the beginning of March, but very little water will be needed until the spring growths are about six inches high. Afterwards watering only moderately, in order to keep the pseudo bulbs dwarf and to ensure free blooming. They are best grown in small pots. I always place four bulbs in a 32 sized pot, making each one firm with a stick, and the roots which have decayed trimmed off close, so that there is nothing to hold the bulbs firm without a little assistance, and, after potting, the plants should be kept well up to the light and in the full blaze of the sun, as recommended for Lælia autumnalis. By the beginning of July the plant will most probably have finished flowering, and from then until March it possesses no great beauty, but water should not be discontinued until November, after which time it may be given once or twice in three or four weeks, until March. Sometimes the growths, when they do not produce flowers, continue growing to four or five feet in length, and when well grown the plant increases in size very rapidly. Red spider is most troublesome to this plant, and directly it can be detected the growths should be sponged with soapy water. A fair average price for strong flowering-sized bulbs is about 3/- each.

ZYGOPETALUM MACKAYI. From Brazil.

This is a winter-blooming species, generally making a good display about Christmas. It is a strong growing plant when in good health, producing spikes about two feet in length bearing six to eight flowers, the sepals and petals of which are of a greenish colour, spotted with brown, the lip being white, exquisitely pencilled with blue lines. The plant should be repotted during March, and the thick fleshy roots delight in a compost of lumpy yet fibrous loam, with peat and coarse river sand and broken charcoal. The pot should be half filled with good drainage with a layer of moss on the top of it, and the plant should receive water in moderation, never allowing it to be continually saturated or to become too dry. The time when it should be kept moderately dry is the short period after flowering until active growth sets in. In potting keep the soil below the level of the rim and press down moderately firm, afterwards standing the plants on the stage of the house.

Good established plants should be purchased for about 10/- per strong leading bulb, and newly imported from 5/- to 7/6.

TWENTY-FOUR ORCHIDS RECOMMENDED FOR A WARM, STOVE, OR EAST INDIA HOUSE.

ÆRIDES ODORATUM. From the East Indies.

This is an old and familiar Orchid, yet one of the best in cultivation, and, like all of this species, is evergreen and has no pseudo bulbs. The flower spikes proceed from the axils of the leaves, bearing a large number of wax-like flowers in the form of a fox's brush (one of this family, A. Fieldingi, being termed the Fox's Brush Orchid), looking very delicate and graceful, and has a very pleasing fragrance. This plant is easily cultivated in a Warm house with a moist temperature, these being essential requirements for its successful cultivation. I prefer pot culture for it, although I have seen it well grown in baskets, letting the growth take its own course and ramble where it pleased. The drainage hole in the bottom of the pot should be enlarged and the pot filled to within three inches of the rim with broken pots and charcoal, into which the stems of the plants should be placed, securing them in an upright position with sticks, and all roots which were previously beneath the surface should be carefully laid out upon the crocks, or, if necessary, some may be placed into the crocks, covering with sphagnum to the depth of about three inches, pressing it down firmly, and shearing off the rough ends of the moss with a pair of scissors, any aerial roots remaining as before, but all that can conveniently be bent down to the surface of the moss should be pegged there by means of small pegs or sticks, so that they may enter the moss of their own accord, for if placed beneath the surface after being exposed to the air they generally die.

It is not necessary to remove the whole of the old sphagnum every year, but a surfacing of new may be applied at times, and it should be kept well watered during summer, but not so much given at the roots in the winter, yet never allowed to get too dry. This Orchid exists chiefly on the atmosphere, and during its time of flowering on no account should it suffer from drought, or an unnecessary loss of foliage will occur, and it should be grown on a

stage on the north side of the house, or in some other rather shaded situation. When the plant loses its bottom leaves some cultivators make a practice of cutting the stem and lowering the plant in the pot so that the plant may be clothed with foliage down into the pot, but this is not a good practice, for if left alone new growths will shoot from the bare stem and will in time hide this bareness. Of course, should the lower part of the stem be in a bad condition, and without roots, and to all appearance dead, then it should be lowered by cutting away all that which has decayed.

The family of Ærides is generally very subject to a small brown scale which clings tenaciously to the leaves and must be removed by some means without injuring the latter, and afterwards sponging occasionally to keep the scale down.

Good strong plants of this species should be purchased at from 7/6 to 21/- per leading growth, according to its strength and height. Established.

Angræcum sesquipedale. From Madagascar.

This is one of the most remarkable and beautiful Orchids in cultivation, and is usually called the "Comet Orchid," the flowers of which are large, of a lovely ivory-white, of good substance, as though formed of wax in the form of a star and with a tail upwards of twelve inches in length, this appendage being a peculiarity with all the members of this family. It is a plant of easy growth, requiring similar treatment to that recommended for Ærides odoratum, which is of similar habit, and should be grown in pots, in sphagnum, and is very partial to a moist, shady part of the house, but not far away from the glass; a humid atmosphere best suiting it during the growing season. It flowers during the winter months (December and January), and it must be borne in mind that, in cultivating Orchids of this class, every effort should be made to maintain their foliage, for, when no pseudo bulbs exist, the foliage is a great source of strength; therefore, it is best to avoid extremes in drought and cold, especially when the plants are bearing their flower spikes.

Good strong plants of this Orchid are expensive, and one that would produce two flower spikes with three or four flowers on each, would cost from 40/- to 50/-. Good healthy young plants, which would produce one spike with two or three flowers, and suitable for growing on, should be purchased for about 21/-.

ANGRÆCUM SANDERIANUM. From Madagascar.

This is a much smaller growing species than the foregoing, and the flowers, which are pure white and numerous, are arranged very neatly on either side of a pendulous spike about one foot long, and forming a beautiful natural spray, which can be used with charming effect in a lady's toilette, either for the shoulder or hair. It should be grown in small baskets or pans suspended from the roof in a moist and shady part of the house, and requires exactly the same kind of treatment as recommended for A. sesquipedale. The flower spikes commence growing in the autumn, but do not open their blossoms until February or March.

Good strong plants should be from 10/6 to 21/- for one leading growth capable of producing one or two spikes each year.

CALANTHE VEITCHII. Garden Hybrid.

Calanthes are found in most of the large establishments, even where Orchids generally are not cultivated, and being winter-blooming plants they are popular favourites. A compost of good yellow turfy loam, with a good amount of broken charcoal and coarse silver sand added, is the best for it. The pot should be filled to one-third its depth with good drainage, and the compost, which should be pressed moderately firm, left half-an-inch below the rim in order that the plant can be well watered. The bulbs should be potted singly, either into 48 or 32 pots, or two smaller ones in a 32, and should have the old compost and roots entirely removed before being placed into the new pots. The base must be inserted about half-an-inch deep in the fresh compost, and secured in an upright position with a small piece of stick to which the top of the bulb can be fastened, when new roots will speedily be formed. Repotting should take place every year, for it is highly injurious to these Calanthes to be kept in the same soil two years in succession; doing it in February or March, when the new growths are about one inch long and young roots begin to push out and are ready to take firm hold of the new soil.

Although many persons grow Calanthes extremely well, there are numerous others who signally fail in doing so, owing to some details in management not being understood, such as care in watering and the position the plant occupies after the bulbs are potted. They should be placed in the warmest house, quite near

to the glass, a high shelf being a most suitable place, where there is an abundance of light, and very little water given, not commencing the watering until a week after repotting and about once a week after, until the foliage is well up and strong and the plants well rooted, and then they should have water as often as ordinary plants.

With strong growth the formation of new bulbs takes place about July and then a little weak liquid manure is beneficial, such as can be obtained by soaking cow or sheep manure and using it in a well diluted form, once a week until the flowers commence expanding and the bulbs become denuded of foliage, then cease giving liquid manure, and only give sufficient water to keep the soil from becoming too dry and to keep the flower in full vigour.

When the plants are out of flower water may be entirely withheld until the potting season in March comes round, the plants in the meantime being kept in a light and dry place, but when in flower they can be removed to a warm conservatory or greenhouse, where the flowers will last a month longer in perfection; they are cheap, and of easy propagation, the new pseudo bulbs often throwing two new growths, whilst the old ones, also, grow and form new small bulbs, if laid upon some sphagnum or something of a similar nature and kept moist. The flower spikes are from two to three feet high, and the flowers of a bright light rose colour.

Good bulbs are obtainable for 2/- to 3/6 each.

Calanthe vestita rubro oculata, and C. vestita luteo oculata. From Java.

Two varieties which are very useful and generally grown, the flowers of both being pure white, but the variety "rubro" has a red eye, and "luteo" a yellow eye; the flower stalks are not so tall or erect as in Calanthe Veitchii, but the same treatment does for all, and bulbs should be purchased about the same price.

Many wrongly treated plants of Calanthes are subject to a disease known as "spot," which comes on both the foliage and the bulbs, and when once contracted it takes years of excellent treatment to eradicate it; so in purchasing bulbs it is necessary to see that the skin has a clear appearance and is totally free from black marks or spots.

CATTLEYA LAWRENCEANA. From Roraima.

Although this lovely Orchid may be grown with those requiring less warmth, its cultivation is much more satisfactory in a Warm house, and it can either be grown in pots or baskets, but must be well up to the light, and should be in a compost of peat, sphagnum, and broken charcoal, as recommended for Cattleyas (*see page* 28), and the plant should be placed on the south side of the house in a warm and light position.

It is usually late in the season, about October, before the new pseudo bulbs of this species are matured, and the plants should then be placed at the coolest part of the house, or they may be removed to a house having an Intermediate temperature (but this is not necessary), and brought back to the Warm house after blooming in April. The flowers of this species are of good size, varying in number in proportion to the strength of the plant, and the colour is of a rich purple tint.

Good plants should be obtained at from 7/6 to 10/6 per strong lead, imported or established plants.

CATTLEYA ELDORADO. From Rio Negro.

This is another handsome, delicate coloured species, which does best in a little more warmth than that of the Intermediate house, and it should be grown in pots placed on a shelf or in baskets suspended in the highest part of the house. It flowers during the summer months and requires a high temperature in the winter, so should not be removed from the Warm house. For general treatment as to potting, watering, &c., see the section Cattleyas, page 28.

There is a variety of this species which is pure white and named C. Eldorado Wallisii, and another C. Eldorado crocata, blush white with a deep orange blotch in the throat, but the typical form is more or less of a rose tint with an orange blotch in the throat, and the lip is of a deep purple shade.

Good plants of this species should be purchased at from 5/- to 7/6 per strong leading growth, and in this case also it is preferable to purchase newly imported or semi-established plants, taking great care to preserve the native leaves.

CYPRIPEDIUM LAWRENCEANUM. From Borneo.

The Warm house is really the home for the great majority of this large genus, although there are some few species, as before

stated, which do well in a Cool house. This Cypripedium has two recommendations in its highly ornamental foliage and handsome flowers, the greater beauty of the latter centering in the dorsal sepal, which is white, striped with a number of purple lines. It should be potted as advised for Cypripediums (*see page* 30) and given a shady position on the stage, with a liberal supply of water at all seasons, and, as this family of Orchids is partial to a good deal of water, it is best that they should be repotted at least once in every two years, otherwise the compost may become too much decomposed and the drainage defective, and under such circumstances the plants would not flourish. Should thrip attack them a little tobacco powder dusted into the axils of the leaves will soon accomplish its destruction.

This species flowers during the summer months, and good strong plants are obtainable at from 3/- to 5/- per strong flowering lead.

Cypripedium Sedeni. Garden Hybrid.

This is a lovely and valuable garden hybrid, which continues flowering for some months from one stem, for when one flower is over another appears from the same place, and is of a pale rose shade of colour. Being a very free grower it soon makes a large plant, which produces a good number of flowers during the autumn and winter months, and should have a shady position with the general treatment recommended for Cypripediums.

Plants of this variety should be purchased at from 5/- to 7/6 per strong flowering leading growth.

Cypripedium Roezlii. From Colombia.

This is another very interesting species with the same characteristics as C. Sedeni, continuing to produce its flowers from the same stem for a long time, requiring similar treatment, compost, potting, &c., but is of a stronger habit of growth; it commences blooming in April.

Strong established plants, and such are recommended, can be purchased at from 5/- to 7/6 per strong lead.

Cypripedium Dominianum. Garden Hybrid.

This is another very interesting garden hybrid, and more pleasing and quaint in its character than the two preceding varieties. It is the result of a cross between C. caricinum and

C. caudatum, and is intermediate between the two, the long petals coming from the last named variety, which has long tail-like petals, from 20 to 30 inches in length, and flowers during the spring months. It requires the same treatment, in every particular, as the preceding varieties.

Good plants should be purchased for about 7 6 per strong flowering sized leading growth, which, under proper management, soon grows into a large plant.

CYPRIPEDIUM BELLATULUM. From Cochin China.

In this species, as well as in its allied species, C. niveum and C. Godfroyæ, both of which are most chaste and pretty, an entirely different method of cultivation will have to be adopted, as they do not lend themselves quite so readily to the treatment generally given to Cypripediums. They are, however, of easy culture, if a more decided mode of cultivation is followed. The potting material should consist of a mixture of rich fibrous loam broken into small lumps, adding small lumps of chalk, varying from the size of a pea to that of a walnut, and these two materials, in equal proportions, should be mixed together. The pot should be well drained to one third of its depth, and the plants fixed rather firmly in the compost, bringing the latter almost level with the rim of the pot. The plant should then be placed in a position near the glass—on a shelf would be a most suitable place—where it can have plenty of light, taking care that it is not overwatered, for sometimes where every care is exercised, a leaf occasionally damps off at the axils; special attention must therefore be given to the watering or much serious damage will result from the damping off of the foliage, but it is a plant which really requires but little water at any time of the year, more especially during the winter months, and when it is applied see that the foliage is kept dry or the water frequently lodges in the axils of the leaf and causes damping; in order to prevent this, dip the pot up to the crown of the plant (not over) in a bucket of water, which is better than the ordinary method of watering.

It is not easy to draw a hard and fast rule as to how often the plants should be watered, and growers must be guided by the size of the pot and the quantity of material it contains, as well as the position the plant occupies, for if light and airy the compost becomes dry more readily than if shaded and close; and although

the surface of the soil may appear to be dry the plants may still not require water, owing to the retention of moisture in the chalk and soil. This species flowers during the spring and summer months and is always admired.

Good established plants should be purchased at from 5/- to 7/6 for strong flowering sized plants, and as this species is more readily established than many others of the same genus, newly imported plants may be purchased with good results.

Dendrobium nobile. From Assam.

The Dendrobiums are a beautiful and useful family of plants, easy of cultivation, but some require more warmth throughout the year than others, and for the majority of them it is indispensable they should have a high temperature and moist atmosphere during the summer months, while throughout the winter a cool and rather dry atmosphere is needed to give the plants the necessary rest in order to produce good flowers and growth next season. D. nobile belongs to the latter group. When repotting becomes necessary, use good fibrous peat with an equal proportion of sphagnum and a liberal addition of charcoal mixed together, and the pots or baskets half filled with crocks and charcoal, always repotting just after the flowering season is over. All the old compost should be cleaned away from the roots, which should be carefully handled, before replacing the plant in the new pot or basket, securing the growths by a few neat sticks thrust into the compost, which should be made moderately firm. A good position in the Warm house on the south side, where there is plenty of light, is most suitable at first, watering carefully, and keeping the compost only moderately moist until the roots show signs of activity, then water more freely, for careless watering at this stage often causes a loss of new growth by damping.

As the summer advances the plants gain strength, if not checked by excessive drought or too low a temperature, or failure to keep them clear from red spider or thrip; and the new growth develops into a pseudo bulb, and when it is seen to taper off and the last leaf appears at the apex the new bulb will have ceased growing. This species, however, is so very free growing that as soon as the new pseudo bulb is formed other growths are pushed from the base, sometimes even before the new bulb has finished its growth, but this is of little consequence. Supposing the principal or first growths

are completed by September, the plant should at once be removed to a cooler house where it could have plenty of sunshine and air to mature the growth, but when the first growths come to maturity earlier, the plant may still remain in the Warm house to assist the second growths, but not later than September. The removal to a cooler house means the coldest end of the Intermediate house, or even a greenhouse, where the temperature does not fall lower than 40 to 45 degrees in winter, gradually withholding water—giving only just sufficient to prevent shrivelling—and when showing flower the plants should be removed in January into a little more warmth, then the plants would bloom about April, but if wanted in flower a little earlier they should be removed to the warmest house, but avoiding a sudden change from cold to heat, increasing the water gradually, for if given too freely immediately after the plants have come from their resting quarters, buds which should become open flowers sometimes turn into growths. New growth should come from the base not from the top of the pseudo bulb, and flowers appear from the sides of the bulbs formed in previous years. This is always a cheap Orchid at from 1/6 to 2/- per strong leading bulb, and may also be bought newly imported, as they generally make strong healthy plants. The varieties of D. nobile are numerous and vary in size and colour, the most distinct being D. nobile alba, and the best dark form, D. nobile nobilis.

DENDROBIUM AINSWORTHII. Garden Hybrid.

This is a very pretty and useful hybrid, the result of a cross between D. nobile and D. heterocarpum, and more adapted to basket than pot culture, but with the same treatment as that of D. nobile. This also is a cheap Orchid and obtainable at from 3/- to 5/- per strong flowering-sized leading growth.

DENDROBIUM HETEROCARPUM. From the East Indies.

This species is of a golden yellow colour and deliciously scented, and does best in baskets, but with the treatment given to D. nobile, and it also blooms from the preceding year's pseudo bulbs.

Good established plants should be purchased for about 5/- per strong leading bulb, and newly imported plants at a cheaper rate, as they grow very freely. Let 50 degrees be the minimum during winter.

Dendrobium Findleyanum. From Burmah.

Although different in habit to the preceding it is a very pretty species, flowering in the early spring months, the flowers being produced on the newly made pseudo bulbs; a few flowering nodes, however, remain dormant, which flower the following year, in conjunction with the newly made pseudo bulbs, and the temperature of the Intermediate house is sufficiently low for this species during the resting season; like the preceding species, 50 degrees is low enough. In all other respects it should be treated as recommended for D. nobile. Its sepals and petals are white, tipped with pink, the lip having a large yellow blotch in the centre.

This should be purchased at 2/- or 3/- per strong leading pseudo bulb, and may be bought either newly established or imported.

Dendrobium formosum giganteum. From Burmah.

This is a very handsome Orchid, and the flowers are borne at the apex of the newly formed pseudo bulbs directly they are matured, and in large trusses, according to their strength, but this species will not grow satisfactorily unless in plenty of warmth, and it must not be taken into a cool temperature to rest but remain in the warmest house the whole year. It must be grown in pans or baskets, and in transferring plants to either it should be done in spring, just as the new growth begins to push forth; and if in baskets, be suspended in the warmest part of the house on the shady side, giving compost and treatment similar to that of D. nobile. Watering should also be done in a similar manner, only that, being kept in a much higher temperature during the resting season, it is unable to endure so much drought and should therefore have more water. It flowers during August and September, and the flowers are large and pure white, with the exception of a small orange blotch on the lip. Occasionally yellow thrip will attack the young growth, and tobacco powder should immediately be applied for their removal.

Good plants should be purchased from 3/- to 5/- per strong leading pseudo bulb, and it is best to obtain newly imported or semi-established plants.

Dendrobium Phalænopsis Schrœderiana. From New Guinea.

This is a very useful and beautiful autumn-flowering Orchid, similar in habit to D. superbiens and D. biggibum, and the flowers of this species are produced on spikes issuing from the top of the newly formed pseudo bulbs. The flowers vary considerably in colour, some being pure white, others a rich dark rosy purple, but the majority are of a rich rosy-tinted shade. The plants require exactly the same culture as that for the last named species, with this important difference, it must occupy a very light position during the growing season instead of a shady one. I have always found this plant to do well when suspended from the roof or placed on a shelf in the hottest portion of the house, giving plenty of water during the summer, and at no time allowing it to get dry enough to cause much shrivelling as this greatly injures the plant.

Thanks to the large importations which have recently arrived this plant can now be bought at a low price—say, about 5 - to 7/6 per strong leading growth.

Dendrobium Wardianum. From Burmah.

I may assuredly say of this, that it is a magnificent species, and, fortunately, plentiful in this country, as large importations are received every spring. I recommend newly imported plants, and sturdy pieces should be obtainable for about 2 - or 2 6 per strong lead. It may be grown in either pots or baskets and with the same treatment as D. nobile, both in the growing and resting seasons. But with this species it is necessary to give definite treatment, for, unlike the last named, it is most detrimental to the plant when it starts into growth a second time in the same year, and any such attempts should be frustrated at the outset. In order to prevent this it should be removed to a cooler temperature immediately the pseudo bulbs are completed, gradually withholding water. It is quite natural, however, for such growth to make its appearance after a cool and dry rest, and at the same time pushing its flower buds from the last formed pseudo bulbs; but the appearance of either growth or flower bud should not tempt the cultivator to straightway place his plants in greater heat, but to continue a cool treatment so as to ensure slow and sturdy growth, and when placed in more warmth, about February or March, it will make

rapid progress and speedily bloom, and every encouragement should then be given the plant to make healthy growth, by giving it abundance of light, heat, and moisture. The sepals and petals are pure white, handsomely margined with bright pink, and in the centre of the flower are orange and chocolate blotches.

PHALÆNOPSIS SCHILLERIANA. From the East Indies.

This Orchid is one that has baffled many good growers, even those who have everything that is necessary to successful cultivation within their reach, yet from some unexplainable reason they fail to make much headway with this plant. This is somewhat difficult to understand, as others who only give ordinary care and attention obtain excellent results, much seeming to depend upon the house in which it is grown. I, however, advise everyone to give it a trial, for, if the place suits it, the plant is of great interest, even when not in bloom, on account of its handsome foliage.

Its handsome flowers are produced on long branching spikes, from December to February, and are of a soft pale mauve tint, and it should be grown in baskets suspended near the glass on the shady side of the house, too much bright light being injurious, and it should be placed into the basket in much the same way as recommended for Aerides odoratum, simply fixing in the sphagnum over a good drainage of crocks and charcoal, and the foliage will then droop over the sides of the basket. Give a liberal supply of water during the summer, but less, and with great discretion, during the winter, never allowing the sphagnum to get dust dry, or the plant, having no pseudo bulbs, will lose its foliage, which is prejudicial to future growth. It should be grown at the warmest part of the house and its leaves occasionally sponged to keep down insects, using tobacco powder if thrip appears.

Phalænopsis are at times injuriously affected by a watery spot forming on the leaves, and this should at once be cut away with a sharp knife or it will soon spread and eat away the leaf, and generally speaking, when this disease occurs, the idea of successfully growing the plant may be abandoned. The spot is often produced from some fault in management, such as from a very cold temperature, keeping the plants saturated in winter, or some other cause.

Good plants, suitable for growing on and established, should be purchased at from 10/6 each.

ONCIDIUM PAPILIO. From Caracas.

This Orchid is known principally on account of its remarkable resemblance to the butterfly, hence its name, the Butterfly Orchid, and can be grown either on a block or in a small pan or basket, and should have the same treatment as the Phalænopsis Schilleriana. It is a compact growing plant, taking up but little room and requiring only a small pan or basket, in which it should be securely fixed. The flower spikes, which are long and slender, are produced from the base of the last pseudo bulb and the flower at its apex, one following the other in succession for several years, so that the old spikes should never be cut away unless the plant gets into a weak condition.

Plants may be purchased for from 4 - to 5 - per leading bulb, and newly imported plants may be purchased with highly satisfactory results.

PHAJUS GRANDIFOLIUS. From the East Indies.

This is an excellent old Warm house terrestrial Orchid and is to be found in most gardens of note. The compost most suitable being loam and lumpy peat in equal parts, adding a little coarse sand and broken charcoal, and when repotting is necessary it should be done immediately after flowering in February or March, following the directions given for Cymbidium eburneum (*see page* 101), and watering only when dry. It should be grown in pots placed on the stage on the shady side of the house, and as this species is subject to attacks from yellow thrip, tobacco powder should be dusted well into the axils of the new growth in order to dislodge or destroy the insects.

Good plants should be bought at from 5 - to 7 6 per strong leading growth.

STANHOPEA TIGRINA. From South America.

This is one of an extremely interesting family of Orchids and of considerable beauty and richness of colour, which counterbalances the short life of the flowers. This species must be grown in baskets having no crocks at the bottom, and only sphagnum and fibrous peat. It flowers during the summer months, and these are produced on spikes which have pushed their way downwards through the soil and basket, so that crocks would greatly intercept and damage the flowers. The ground colour of the flower is either

pale or orange yellow, spotted and barred with dark chocolate-red, and the flowers give out a very powerful perfume which pervades the whole house, and from its habit of pushing its flowers through the roots must be grown in baskets suspended from the roof at the coolest part of the house, giving water in moderation all the year. The leaves should be sponged occasionally to keep down red spider, and if attacked by thrip use tobacco powder. Insecticides are very dangerous to the young growths, frequently causing them to rot, even when applied in a weak form.

Good plants from 5/- to 7/6 per strong leading growth.

CHYSIS BRACTESCENS. From Peru.

This is a handsome species, bearing large trusses of wax-like white and yellow flowers during March or April, and although very beautiful, the flowers are rather short-lived; it may be grown with the Dendrobiums, as it requires exactly the same treatment as regards heat and moisture during summer and a cool rest during winter. It should be grown in a basket suspended in a light position, and being subject to yellow thrip tobacco powder should be used in preference to insecticide, as the young growth is very tender and liable to rot. The flowers push forth simultaneously with the new growth.

Newly imported or established, 3/6 to 5/- per strong lead.

The inexperienced cultivator, in following the instructions laid down in the selection of twenty-four Orchids for Cool house culture and the same number each for the Intermediate and the Warm house, will begin to understand how to ensure good results and obtain a thorough knowledge of their requirements, and knowing the extent of his resources will be able to realise what reasonable chance he has of success with his plants, and have a fair idea also of the probable cost of good plants to start with.

It has occurred to me that some who may have the means at command for still further extending their collections may be glad to have reliable information as to other sorts they may desire to grow; therefore, I propose to give a supplementary list of another twenty-four Orchids suitable for Cool house culture, also twenty-four more for the Intermediate house, and the same number for the Warm house.

SUPPLEMENTARY.

TWENTY-FOUR ORCHIDS FOR COOL HOUSE.

ODONTOGLOSSUM HALLII. From Ecuador.

This Orchid requires the same treatment as O. Alexandræ, the sepals and petals of the flower being of a yellowish tint, blotched with bright brown, the lip white and yellow, flushed with purple.

Price 5/- to 10/6 per strong lead, purchased as newly imported or as established plants. Flowers during the spring months.

ODONTOGLOSSUM LUTEO-PURPUREUM. From Colombia.

This requires the same treatment as O. Hallii, and there is also great variation in this species. The flowers of the typical form are of a yellowish ground colour, with large blotches of bright brown, whilst the lip is also yellowish, with brown spots, and it flowers during the winter and spring months.

Good strong leading bulbs should be bought at from 4/- to 7/6 each, and may be had newly imported or established.

ODONTOGLOSSUM EDWARDII. From Ecuador.

This should have the same treatment as recommended for Oncidium macranthum (*see page* 86), and the flowers are pretty, of a violet-purple colour, and are freely produced on long erect branching spikes during the spring.

Plants, either established or newly imported, from 5/- to 10/6 each strong lead.

ODONTOGLOSSUM BICTONENSE. From Guatemala.

This requires the same treatment as the last named, and it flowers during the autumn and winter months—the sepals and petals are greenish, with brown spots, and the lip of a pinkish colour. There is also a white variety of this species.

Newly imported or established plants, from 3/6 to 5/- each.

ODONTOGLOSSUM BLANDUM. From Ocana.

This requires the same treatment as O. Alexandræ. The flowers are delicate and neat and borne on slender, short spikes, the ground colour white, densely spotted with reddish brown, and emitting a pleasant perfume.

Newly imported or established plants, from 5/- to 10/- each.

ODONTOGLOSSUM MACULATUM. From Mexico.

This requires the same treatment as Oncid. macranthum (*see page* 86). It produces its flowers during the winter months, and in colour is a combination of green, chocolate, and purple.

Newly imported or established plants, 3/6 to 5/-.

ODONTOGLOSSUM CORDATUM. From Colombia.

This requires the same treatment as the last named, and it blooms during the winter and spring months, the sepals and petals being of a yellowish tint, covered with broad marks of chestnut-brown, and the lip white, with brown spots.

Newly imported or established plants, 3/6 to 5/- each.

ODONTOGLOSSUM PULCHELLUM MAJUS. From Mexico.

Requires the same treatment as the last-named species, and blooms during the winter and spring months, sending up neat spikes, which carry a number of pretty white flowers.

Newly imported or established plants, having not less than four or five leads, should be bought for 5/- and 7/6 per plant.

ODONTOGLOSSUM NEBULOSUM. From Mexico.

Requires the same treatment as the last-named, and the flowers of this species are white, more or less spotted with reddish brown and are produced during the winter and spring.

Newly imported or established plants, 3/6 to 5/- each.

ONCIDIUM MARSHALLIANUM. From Brazil.

Should be grown in pans or baskets and suspended, and the flowers are produced on long branching spikes, which make their appearance from the base of the new bulbs in autumn, and grow all the winter. The chief beauty in this flower is the large and bright yellow lip, and this Oncidium has also the reputation of deteriorating, and it does if allowed to flower from weakly plants. It is therefore advisable to pinch off the spikes of such every alternate year.

It is best to purchase newly imported or semi-established pieces at from 5/- to 7/6.

ONCIDIUM FORBESII. From Brazil.

This species must be grown exactly the same as the last-named, and also deteriorates if allowed to flower each year, so that it is

advisable to pinch off the spikes from all weak or undersized bulbs. Its flowering time is in the autumn, and the flowers are of a rich orange-brown, edged with gold. It is an exquisite Orchid when well grown.

Newly imported or semi-established plants, 3 6 to 5 -

ONCIDIUM ORNITHORRHYNCHUM. From Guatemala.

This requires the same treatment as O. macranthum, and is a free growing and floriferous species, producing delicate branching spikes with a number of small strongly perfumed flowers of a rosy purple colour; blooming during the winter and spring months.

Newly imported or established plants, from 3 6 to 5 - each.

MASDEVALLIA HARRYANA CERULESCENS. From Colombia.

This should have the same treatment as recommended for M. Harryana (*see page* 14), as this is only one of its many varieties, but the flowers are of a larger size and the colours more rich and brilliant; it flowers in the spring.

Established plants can be purchased of the true variety at 5/- per two leading growths.

MASDEVALLIA CHELSONI.

This is a garden hybrid between M. Veitchiana and M. amabilis, and is a free grower and bloomer. It should have the same treatment as M. Harryana, and this variety also flowers during the winter.

Good plants, with three or four leads, about 5/- each.

MASDEVALLIA SHUTTLEWORTHII. From Colombia.

This is a pretty little species and should be grown in small baskets or pans suspended, and with the same treatment as M. Harryana; it flowers during the spring months. The flowers are rose and yellowish green, more or less spotted with dark red.

Established plants, with about four or five leads, 7 6.

PLEIONE LAGENARIA. From Khasia Hills.
(The Indian Crocus.)

In this very beautiful little Orchid we have one differing in so many respects from the majority, for there are no old pseudo

bulbs, as these become exhausted by the time the new pseudo bulbs are matured about September, at which period the latter lose their leaves, and from the base commence pushing up their flowers, which expand in October and November, and immediately they have flowered the plants can be shifted into a fresh compost of loam, peat, and sand. The pans should be three parts filled with drainage and the compost left level with the rim, and on this the bulbs should be placed, from 10 to 12 in a 6-inch pan, at equal distances apart. These should be secured in their positions by means of small pegs, and the surface between the bulbs carefully covered with sphagnum. Very little water will now be required—simply enough to keep the sphagnum moist until the foliage is well up, when a liberal supply may be given until the growth is completed.

This species is very partial to much air and light and should therefore be suspended near to the glass, and if possible, without injury to the other plants, let this have direct sunlight upon it, seeing at the same time that the plant does not suffer from drought. Watering must be less frequent when the bulbs are matured and begin to lose their foliage. The sepals and petals are of a mauve-rose tint, and the lip white, yellow, and dark crimson, and the flowers open near to the surface of the pan and are singularly beautiful.

Newly imported or established plants, 1/- to 1/6 per strong bulb.

PLEIONE MACULATA. From Assam.

This is a lovely companion to the preceding, and should have similar treatment, but cannot withstand the strong sunlight; it also blooms during the autumn, and the sepals and petals are pure white, and the lip white, yellow, and crimson.

Newly imported or established plants, 1/- to 1/6 per strong bulb.

ANGULOA RUCKERI. From Colombia.

This is a noble growing Orchid, and should be treated exactly the same as advised for A. Clowesii. The flowers, which appear in summer from the base of the pseudo bulbs, are of a yellowish ground colour, tinted with orange-red.

Newly imported or established plants vary from 7/6 to 10/6 and 15/- per strong leading bulb.

MAXILLARIA VENUSTA. From South America.

A very pretty sweet-scented Orchid with white and yellow flowers, much in the way of M. grandiflora and require the same treatment. It flowers in the autumn months.

Newly imported or established plants, 3/6 to 5/- per strong leading bulb.

LÆLIA HARPOPHYLLA. From Brazil.

This is a very pretty Orchid, and the uncommon colour of the flower makes it a very conspicuous object when in bloom. It flowers in February and March, and is of a bright orange-vermilion colour; should occupy the warmest part of the house.

Newly imported or established plants at 3/6 to 5/- for two strong leading bulbs.

DENDROBIUM FALCONERI. From Northern India.

This is a very beautiful Dendrobe and amply repays any trouble expended on it, and does best grown on a block of wood, a portion of a Tree Fern stem, or on a teak-wood raft, and may also be grown in pans or baskets. Its natural habit is to send out new growths in great profusion anywhere in the old bulbs, and in time forming a thick mass of short knotty pseudo bulbs, which are connected with the stem or portion of the tree from whence it first started by means of a few slender stems only. This fact should be clearly noted by the cultivator when fixing his plants and it will be seen that there is little use in trying to keep the plant too much confined to the block, but plenty of water should be given to the aerial growths during the summer and up to September, by the free use of the syringe, but after this date the supply of water must be gradually reduced to about once a week, and under this treatment the plant may be expected to flower satisfactorily, but without this long and perfect rest, from November until the nodes are seen to be sending forth tiny shoots it will not. When these tiny shoots appear from either side of the bulb, about March, more water may be given, but only sparingly, otherwise they will turn to growths instead of flowers. After the shape of the flower bud can be detected, it is quite safe to apply water without stint, and this species flowers in May, the colours of the flowers being dark crimson, white, and yellow. The plant should be kept well up to the light.

Buy newly imported clumps in spring at from 3/6 to 7/6.

CŒLOGYNE CRISTATA LEMONIANA. From Nepaul.

This lovely species must be treated in the same way as advised for C. cristata (*page* 92), it being a variety differing only by the colour on the lip being pale lemon instead of orange, and it blooms in February or March.

Established plants, with from four to five leads, at from 7/6 to 10/6.

LÆLIA DAYANA. From Brazil.

This should be treated in the same manner as advised for Cattleya marginata (*page* 93), the chief difference in the flowers being in the lip, and it blooms in the autumn.

Newly imported plants are best, but good established plants can also be purchased, with two or three leads, at from 5/- to 7/6 each.

CYPRIPEDIUM BOXALLII. From Moulmein.

This very pretty species is grown in exactly the same way as advised for C. villosum (*page* 92), and the flowers have a glazed appearance like that species, but in this plant the dorsal sepal is heavily spotted with dark purple, and it flowers during the winter and spring months.

Established plants, 3/6 to 5/- per strong flowering growth.

TWENTY-FOUR ADDITIONAL ORCHIDS FOR THE INTERMEDIATE HOUSE.

AERIDES FIELDINGI. From the East Indies.

(The Fox's Brush Orchid.)

This species should be potted and watered as recommended for A. odoratum (*see page* 111), but it should be grown on the shady side of this house, and it flowers in spring.

Good plants should be obtained, suitable for growing on, at from 7/6 to 10/6. Established.

CYMBIDIUM LOWIANUM. From Burmah.

This is a handsome free-growing species, producing long spikes of flowers during the summer, the colour of a greenish yellow with a blotch of deep red on the lip, and should have the same treatment as C. eburneum (*see page* 101).

Newly imported or established plants, from 5/- to 10/6 per strong lead.

EPIDENDRUM WALLISII. From New Granada.

This is a free-growing species, the small flowers yellow and spotted, and when the plant has grown to a good size it remains a long period in bloom; it should be grown in peat, sphagnum and charcoal, and it can be treated as recommended for Sobralia macrantha.

Established, from 10/- to 15/- per strong leading growth.

LÆLIA CINNABARINA. From Brazil.

This species blooms in the spring months, and the flowers are of a rich, deep, reddish orange colour, and the flower spikes appear from the top of the bulbs—as with all Cattleyas and Lælias—and in some cases the sheaths from which the spikes come appear to be dead, but should not be removed until after blooming. This species will not bear so much sun as L. anceps, and requires the same treatment as Cattleya Trianæ and others.

Newly imported or established, from 3/6 to 5/- per strong leading bulb.

LÆLIA ANCEPS ALBA. From Mexico.

This is a beautiful white variety of L. anceps, and like that species should be grown in a basket, and fully exposed to sunlight, and it flowers during the winter months.

Newly imported or established, 5/- to 7/6 per two strong leading growths.

LÆLIA ALBIDA. From Guatemala.

This pretty little species, which flowers during November and December, has flowers which are mostly white, and will not bear so much sunshine as L. anceps, but in other respects should have the same treatment.

Nice clumps, newly imported in spring, with four or five leads, for about 5/-.

LÆLIA ELEGANS. From St. Catherina.

This is supposed to be a natural hybrid, between Lælia purpurata and Cattleya intermedia, and it may be grown in pots or baskets, but should be placed in the warmest position during the winter.

Nice plants, newly imported or established, should be obtained for about 7/6 to 10/6 per leading bulb.

CATTLEYA SKINNERII. From Costa Rica.

This handsome and useful species blooms in April or May, and is of easy culture, requiring exactly the same treatment as that advised for Cattleyas generally.

Newly imported or established plants, 3/6 to 5/- per strong leading bulb.

CATTLEYA BOWRINGIANA. From Honduras.

This should have the same treatment as the last-named, being somewhat similar, and I have sometimes thought that this species produces a greater number of flowers when grown in baskets and suspended.

Newly imported or established, at 3/6 to 5/- per strong leading bulb.

CATTLEYA AMETHYSTOGLOSSA. From Brazil.

A tall growing species, and therefore must be in pots, requiring the same treatment as Cattleyas in general. The flowers are of a rosy purple colour, more or less spotted with deep magenta.

Good strong leads, newly imported or established, at from 5/- to 10/6.

CATTLEYA INTERMEDIA. From Brazil.

This is a very pretty summer-flowering species, much like C. Harrisoniana in habit of growth, and should be treated like that species, with the exception of the winter time when it is in active growth, during which time it should, if possible, be at the warmest end of the house.

Newly imported or established, 5/- to 7/6 per leading growth.

CATTLEYA HARRISONIANA. From Brazil.

A very useful and pretty species, in appearance very much like C. Loddigesii, but the colour of the flower is much darker and with an orange blotch in the lip instead of lemon—the same treatment is required for both.

Newly imported or established, 3/6 to 5/- per strong growth.

CATTLEYA MAXIMA. From Ecuador.

This is a charming autumn-flowering species and must be treated like Cattleyas generally, but does best in baskets suspended in a shady part of the house. The sepals and petals are of a bright deep rose colour, and the lip is prettily lined or veined with dark red.

Newly imported plants in spring, or semi-established plants, for about 5/- per strong leading bulb.

CATTLEYA PERCIVALIANA. From South America.

This is the earliest of all the C. labiata section, coming into flower in January and February, and the colours of the flowers vary and are very much like C. Mossiæ, the chief characteristic difference being in the exceptionally rich colour of the lip. This species should be grown in company with C. gigas, where it can get plenty of sun, otherwise it fails to bloom freely. During winter it should be placed at the warmest end of the house, otherwise the flowers may not come to perfection.

Newly imported or established, about 5/- per strong leading bulb.

MASDEVALLIA TOVARENSIS. From Venezuela.

This is a small growing, lovely, pure white species, and produces an abundance of flowers in November or December; must be grown in the Intermediate house, for if kept too cold during the winter the plant loses its leaves and dies. The culture, otherwise, is the same as recommended for M. Harryana, but the old flower stems should not be cut off, as these produce flowers again the following season.

Good established plants, with from four to five leads, should be purchased at from 4/- to 5/- per plant.

PILUMNA FRAGRANS. From New Granada.

This species sends up its spikes from the base of the pseudo bulbs during autumn or winter, and its flowers are very pretty, mostly pure white with a little blotch of yellow in the throat, and are deliciously fragrant and useful for bouquet work, and its general treatment should be the same as Cattleyas.

Newly imported or established pieces, from 4/- to 5/- per strong lead.

TRICHOPILIA SUAVIS. From Costa Rica.

This is a lovely species and flowers in March or April, producing flower spikes from the base of the last made pseudo bulbs, and the flowers are nearly white with a number of pretty pink spots on the labellum. This species is best grown in a basket suspended in a light part of the house.

Newly imported or established, from 4/- to 5/- per strong lead.

VANDA CŒRULEA. From Khasia Hills.

This is undoubtedly the best of all the Vandas, and produces its beautiful sky-blue flowers during the early autumn, which last a long time in perfection, but should be cut two or three weeks after they open or the plant will probably become exhausted and fail to give good results the following year. It can be grown in a pot or basket, and up near the roof glass so as to have an abundance of light and air. For instructions as to potting, watering, &c., see Aerides odoratum, page 111.

Unless the culture of this species is very carefully attended to it is apt to get spotted on the foliage, and these spots appear on the tips of the leaves and should at once be cut away to save the leaves.

Newly imported or established plants, with one lead, 7/- to 10/6 each.

VANDA SUAVIS. From Java.

This is another beautiful Vanda, and more robust in constitution than V. cœrulea. It should be grown in a pot occupying a position on the stage with the Cattleyas, and in potting, watering, &c., have the same general treatment as Aerides odoratum. It blooms during the spring months, a strong stem sometimes pushing out three or four spikes, and this species grows to a great height.

Established plants, suitable for growing on, should be purchased for 7/6 to 10/-

CYPRIPEDIUM ARGUS. From the East Indies.

This pretty little species may be grown in a damp and shady part of the house, and treated the same as advised for C. Lawrenceanum, and it produces its flowers in March or April, the dorsal sepal of the flower being heavily spotted.

Established plants, 3/6 and 5/- per leading growth.

LYCASTE DEPPEI. From Mexico.

This species must be treated in the same way as L. Skinnerii, but as it does not bloom until spring a good rest should be given to it through the winter in a light and airy position, which will induce the plant to flower with greater freedom. The sepals are greenish yellow, the petals white, and the lip yellow.

Newly imported plants if possible, or established, 3/6 to 5/- per strong leading growth.

LYCASTE AROMATICA. From Mexico.

This species, if well grown and with a good rest as recommended for L. Deppei, will produce a large quantity of golden yellow flowers from the last formed bulbs in spring, the flowers appearing simultaneously with the new growths, and when the latter is seen to be starting into growth and repotting is necessary, it should then be done, otherwise if the plant is left until it has finished blooming, the new growths will be too far advanced and the plant receive a great check.

Newly imported if possible, or established, at from 3/6 to 5/- per strong leading bulbs.

SOBRALIA XANTHOLEUCA. From Colombia.

This is a handsome yellow flowered variety which blooms in May or June, and must be treated as advised for S. macrantha; but is by no means so plentiful as that species, and is, therefore, more expensive.

Good plants, suitable for growing on, however, should be bought for from 15/- to 21/-, established if possible, or newly imported.

ODONTOGLOSSUM INSLEAYI LEOPARDINUM. From Mexico.

This is a pretty winter-flowering species, and in growth bears a great resemblance to O. grande, in company with which no better place can be found to grow it than the Intermediate house, treating it just the same as the last named variety, except that a little more water must be given in winter until it has flowered. The sepals and petals are pale brown, densely spotted with rich reddish brown, and the lip is yellowish in colour and slightly spotted.

Newly imported plants if possible, or established, at from 5/- to 7/6 per strong leading growths.

THE FOLLOWING ARE TWENTY-FOUR ADDITIONAL KINDS FOR THE WARM HOUSE.

SACCOLABIUM BLUMEI. From the East Indies.

This very pretty Orchid, which flowers in July or August, must be grown in exactly the same way as recommended for Aerides and Angræcums; the flowers, which are produced on long pendulous racemes, are white flushed with rose and splashed with dark rose.

Good plants, newly imported or established, 5/- to 10/6.

CATTLEYA ACLANDLÆ. From Brazil.

This pretty interesting little Cattleya does best grown in a basket suspended on the lightest side of the house, at a cool dry end in the winter. It is a quick grower, and usually makes two or more growths during the summer, flowering from each. The sepals and petals are heavily marked with dark blotches, and the lip is of a pretty rosy purple colour.

Newly imported or semi-established plants, 5/- to 7/6 per two strong growths.

CYPRIPEDIUM CHAMBERLAINIANUM.

This is a new and very pretty species, and, owing to its very recent introduction, has not, in my opinion, yet been seen in perfection. It has a number of flowers in succession on one spike, the

predominating colour being a pleasing shade of purple, and should have the same treatment as the last named species.

Established plants, 5 - to 7 6 per strong leading growth.

CYPRIPEDIUM CURTISII. From Sumatra.

This species also has prettily marked leaves, and the dorsal sepal is white and green with slight purple veins, the petals being very similar in colour but with darker spots, and the pouch is of a purplish colour, and it should have the same treatment as the last named.

Established plants, about 5/- per strong lead.

CYPRIPEDIUM HOOKERI. From Borneo.

This species also has strongly marked foliage, and its flowers are exceedingly interesting; the prevailing colours are green and purple, the petals being spotted, and it should have the same treatment as the last named.

Established plants, 3 6 to 5 - per strong leading growth.

CYPRIPEDIUM NIVEUM. From the East Indies.

This is a chaste lovely little species, with pure white flowers, with the exception of a few very small dust-like purple spots. It flowers in the summer, and must be grown in the same way as C. bellatulum.

Newly imported or established plants can be bought at from 3/6 to 5/- per small clump.

CYPRIPEDIUM VENUSTUM. From Sylhet.

The foliage of this species is decidedly ornamental and the flowers are also very pretty, the dorsal sepal of a greenish colour, tinted with yellow and veined with purple, and the sepals are similarly coloured, whilst the lip is of a purplish tint veined with green. It should have the same treatment as C. Lawrenceanum.

Established plants, 3 6 to 5/- per strong flowering-sized lead.

CATASETUM BUNGEROTHII. From Venezuela.

This is a beautiful Orchid, the flowers of which are large and of a wax-like, ivory white colour, requiring the same treatment as recommended for Chysis bractescens. The flower spikes push up from the base of the new pseudo bulb immediately its growth is completed, which is generally about July, and after flowering it

should have a rest, as with Dendrobiums, letting 50 degrees be the lowest winter temperature.

Newly imported or established, 7/6 to 10/6 per leading bulb.

MILTONIA ROEZLII. From Colombia.

(*Syn.* Odontoglossum Roezlii.)

Truly a lovely Orchid, the flowers of which are produced at nearly all seasons of the year and are pure white, sometimes with a yellow or red eye in the centre. It is, however, rather difficult to cultivate unless in the position adapted to it, then it will grow freely, and the coolest and dampest end of the house, where the foliage gets damp nightly, suits it admirably.

Established, 3/6 to 5/- per strong leading growth.

DENDROBIUM CHRYSANTHUM. From Upper Burmah.

This species flowers in the autumn from the pseudo bulbs just formed, and whilst many of the leaves are still quite green, it should therefore not be dried to excess during the winter after flowering growth recommences, but placed in an intermediate temperature and moderately watered, when it will grow gently on until spring and can then be placed in the Warm house. It should be grown in a basket, suspended, and the long bulbs allowed to droop downwards, often attaining a great length. The flowers are of a deep golden yellow, marked in the centre with almost blackish chocolate.

Newly imported or established, 2/6 to 5/- per strong lead.

DENDROBIUM CRASSINODE. From the Arracan Hills.

A beautiful species, requiring exactly the same treatment as recommended for D. Wardianum (*see page* 121). The flowers rival that lovely variety in point of beauty, but are smaller. Keep a little warmer in winter.

Newly imported or semi-established, 2/6 to 5/- per strong lead.

DENDROBIUM DENSIFLORUM. From the Khasia Hills.

This is another lovely golden-yellow flowered species, growing and flowering in the same manner as D. thyrsiflorum (*see page* 104), and should be placed with that plant during the winter months when in a dormant state, and always treated in a similar way.

Newly imported or established, 2/6 to 5/- per leading growth.

DENDROBIUM PIERARDII. From the East Indies.

This very pretty species should be grown in pans or baskets, as the growth has always a downward tendency, but in all other respects it should have the same treatment as advised for D. Wardianum, which suits it admirably. The flowers are of a creamy white colour and produced in spring.

Newly imported plants are best, or established, from 1 6 to 3 6 per strong lead.

DENDROBIUM LUTEOLUM. From Moulmein.

The flowers of this species are of a lovely primrose-yellow, and it should be grown in baskets suspended in a light position, and when its growth is completed may be rested in an intermediate temperature, but being an evergreen species it should not be dried off too much. The flower buds soon push forth and expand if the plant is left in this house; remove into more warmth after it has ceased flowering.

This species is in the habit of making a great number of aerial growths, and these, as with D. Falconeri, should be allowed to remain, bringing them down to the compost only when potting.

Newly imported or established, 2 6 to 5 - for good plants.

PERISTERIA ELATA. From Panama.

(The Dove Orchid; also the Holy Ghost plant of the Natives.)

It produces its flower spikes in the summer months from the base of the pseudo bulbs, some of which I have seen as large as a cocoanut. The spike bears a number of flowers which are white, and in the centre of each a portion of the flower bears a close resemblance to a small dove, and it is altogether a most interesting plant. It should be potted and treated in the same manner as advised for Phajus grandifolius.

Newly imported or established, 5 - to 7 6 per lead.

ONCIDIUM KRAMERIANUM. From Colombia.

This is another variety of the Butterfly Orchid, at first sight very closely resembling O. Papilio, but on examination there is much difference in the two species; both, however, require the same treatment.

Newly imported or established, 3 6 to 5 - per strong lead.

ONCIDIUM CAVENDISHIANUM. From Guatemala.

A very pretty species, and the flowers are produced during the winter months on spikes from the base of the last formed growth, and are yellow with brown spots. The pseudo bulbs are very minute in comparison with its large fleshy leathery leaves, and it should be grown in pots on the light side of the house.

Newly imported or established, 3/6 to 5/- per strong lead.

STANHOPEA OCULATA. From Mexico.

This is another showy species, and should be cultivated exactly as advised for S. tigrina (*see page* 123), and the ground colour of this species is light yellow, thickly marked with bright chocolate spots, and it flowers in the autumn.

Newly imported or established plants are from 5/- to 7/6 per strong leading bulb.

STANHOPEA INSIGNIS. From Brazil.

This species is also very showy and blooms during the summer months, and must be treated in the same way as the foregoing.

Newly imported or established plants are worth from 5/- to 7/6 per strong lead.

MORMODES PARDINUM. From Mexico.

This is a handsome and curious Orchid, and flowers in the same manner as Catasetum Bungerothii and must have the same treatment in every respect. The ground colour of the flower is yellow, densely spotted with chocolate.

Newly imported or established plants, 5/- to 10/6 per strong lead.

CATTLEYA SPECIOSISSIMA. From Caracas.

(*Syn.* C. Luddemanniana).

A lovely species of the labiata section, the flowers very much resembling those of C. Mossiæ, and it flowers during the autumn months. This species, like C. Aclandiæ, is rather difficult to grow and flower successfully unless given a warm temperature, and it should be grown in a pan or basket suspended in a very light position.

Newly imported or established, 5 - to 7/6 per strong leading bulb.

ONCIDIUM FLEXUOSUM. From Brazil.

This is a small-flowered species, but generally admired on account of its freedom of growth and its light and graceful many-flowered spikes, the colour of the flowers being yellow and brown. It has a somewhat rambling habit of growth, and does best when grown in a pot in the usual compost of sphagnum and peat, and placed in the shady side of the house, the plant always thriving well in a moist atmosphere, as the roots feed on the air. When it is found necessary to repot it, the leading growth should be kept well down into the compost, so that a fresh start in growth is made from the latter. This species requires a good supply of water at the root and should not be allowed to get too dry even in the winter, and it flowers during the summer months.

Good plants should be purchased for about 5 - per strong leading growth.

CYPRIPEDIUM BARBATUM. From Mount Ophir.

This is another species with pretty marked foliage, and produces its flowers during the summer months, the dorsal sepal being white, green, and of a dark purplish colour, and the pouch tawny brown, while in some of its varieties the colour is much darker than in others. The pouch of the true C. barbatum nigrum is almost black.

Established plants, 3 6 to 5 - per two leading growths.

CYPRIPEDIUM STONEI. From Borneo.

This very pretty species should be in every collection. The dorsal sepal is china white, pencilled with red and purple, and shaded with ochreous yellow; petals long and narrow, same colour as the sepals; and the lip or pouch dull purple, with reddish veins. There is a variety, C. Stonei platyænium, which is very handsome, unique in its beauty, and is also expensive, and is likely to remain so, as C. Stonei does not increase so rapidly as most of the other Cypripediums. It should have the same treatment as C. Lawrenceanum.

Established plants, 7 6 per strong leading growth.

There are of course many other beautiful kinds which could be enumerated, indeed, the supply of species together with their separate varieties is almost inexhaustible, but I feel that quite sufficient have been named to answer the purpose for which this book is compiled, *i.e.*, that of placing the new beginner upon a solid foundation from which to work.

In addition to the many gardening periodicals which treat more or less on Orchids, there are also many books which have been published from time to time, some of which could be taken up with advantage, after this little book has been thoroughly digested, but until the rudiments of Orchid culture are understood, such books may perplex rather than assist. Acting on this principle I have omitted long botanical descriptions of stem, foliage, date of introduction, or their early history, neither have I endeavoured to correctly describe the colours and shape of the flowers, only sufficiently to enable the beginner to form an idea as to whether he possesses the correct species or not, and I have enlarged somewhat fully, but in simple terms, on the cultural treatment required by the various families of Orchids.

Orchids which may be grown in Vineries or Peach Houses.

In an early chapter it was stated that I could not advise the culture of Orchids in fruit growing houses, and I intended these words to apply to Orchids generally, but when a vinery or peach house has been started early in the year, in February for instance, then the warmth such a house would afford would exactly suit the requirements of a few species of Orchids, and materially assist the plants in forming their new pseudo bulbs. By the time the fruit had ripened, and it became necessary to give the vines or fruit trees plenty of air in order to thoroughly ripen the wood, the new growth of the Orchids would be in an advanced condition and able to withstand, and indeed, would be benefited by large quantities of air and cool treatment, provided it be not too cold, remaining here until it became necessary to start the houses in the following year.

The following list indicates such Orchids as would be likely to succeed, and generally do well under such treatment, although I by no means assert that they are *sure* to do so, and it would be necessary to start with good plants and pay strict attention to cleanliness:—

Dendrobium Ainsworthii
" chrysotoxum
" crassinode
" Findleyanum
" heterocarpum
" Leechianum
" lituiflorum
" luteolum
" nobile
" Pierardii
" primulinum
" suavissimum
" thyrsiflorum
" tortile
" Wardianum

Lælia albida
" anceps (in variety)
" autumnalis

Sobralias, all the species

Thunias, all the species

Vanda suavis
" tricolor
" cœrulea
" insignis
" Kimballiana

Barkerias, all the species

Catasetums, all the species.

Cattleya Mossiæ
" Gaskelliana
" gigas
" Harrisoniana
" Trianæ

And others of the labiata section

Cœlogyne cristata, and its varieties
" Massangeana
" Sanderiana
" corrugata
" ocellata

Cymbidium eburneum
" Lowianum

Cyrtopodiums, all the species

Cypripedium amandum
" Argus
" Arthurianum
" Ashburtoniæ
" barbatum
" Boxallii
" cardinale
" crossianum
" Harrisonianum
" hirsuitissimum
" insigne, and its varieties
" Lathamianum
" Leeanum
" nitens
" œnanthum
" purpuratum
" Sallieri
" Schlimii
" Sedeni
" Spicerianum
" venustum
" villosum

Orchids in Smoky Towns.

Although many kinds can be grown in town gardens there are some, the delicate flowers of which open in the winter and are not suitable for cultivation where a smoky, foggy atmosphere prevails, such, for instance, as the genus Phalænopsis, and this is much to be regretted as the plants are often so much at home in town gardens, and are frequently met with in a flourishing state under such circumstances, but as they generally bloom in the winter the flowers are much too delicate to withstand dense fogs and the flowers therefore rarely open, the buds turning yellow and dropping off.

The spring-flowering Dendrobiums also give trouble in this respect, such species as D. nobile and the numerous hybrids produced from it, notably D. Ainsworthii, D. Leechianum, and such species as D. Wardianum, D. crassinode, and a few others, for heavy fogs are almost certain to destroy the flower buds of these varieties which flower early in the season if placed in too much warmth.

It is, therefore, better to retard their blooming by keeping them cool and not allow the flowers to expand until April, then the flowering state may be expected to be more satisfactory as the fogs then are fewer and less dense.

Some of the Cattleyas also give trouble, especially C. Percivaliana, and C. Trianæ, both being early-blooming species, and invariably lose their flower buds under the influence of dense fogs.

There are several other kinds which also suffer, but not so severely as those already mentioned, such as Lælia anceps and other winter-flowering Lælias, the Calanthes, Cattleya labiata, and all of these suffer in a more or less degree, sometimes managing to unfold their sepals and petals but perhaps only for a short time.

Cypripediums are to be recommended as probably the best kind of Orchids for the greenhouses of large towns, for although a large number of these flower in the winter, the flowers are better able to resist, without injury, the action of thick smoky fogs, but which would be fatal to the bloom of others, and it is also such an interesting family, all being evergreen, and many with handsomely marked foliage, the flowers varying so much in form and colours, and a moderate-sized collection of them ensures an interesting display of flowers throughout the year.

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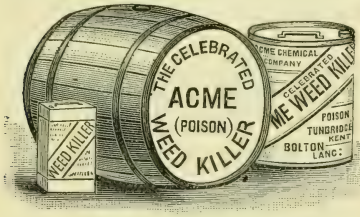
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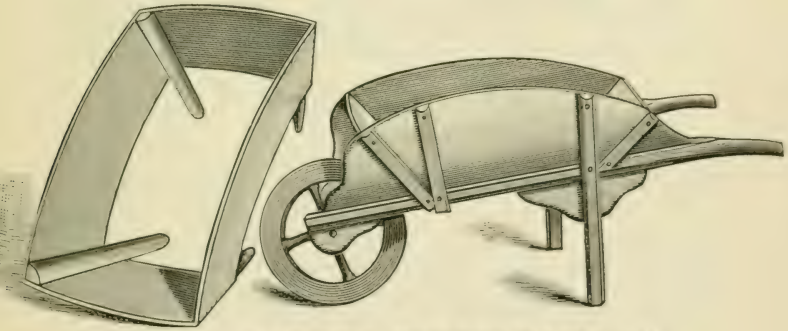
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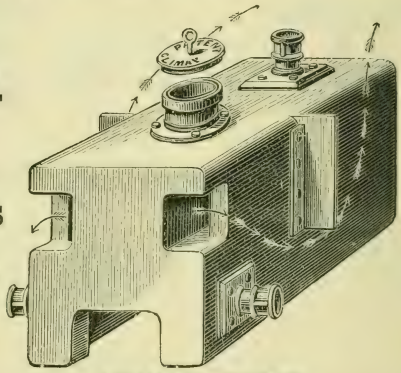
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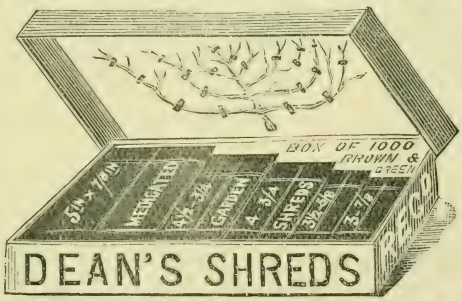
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MEDICATED GARDEN SHREDS.

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FOR NAILING WALL TREES, VINES, AND CLIMBING PLANTS.

NEAT. STRONG. DURABLE.

They discourage and sicken Insects, whereas woollen scraps, leather cuttings, and rags harbour and encourage them. A necessity in all well ordered gardens.

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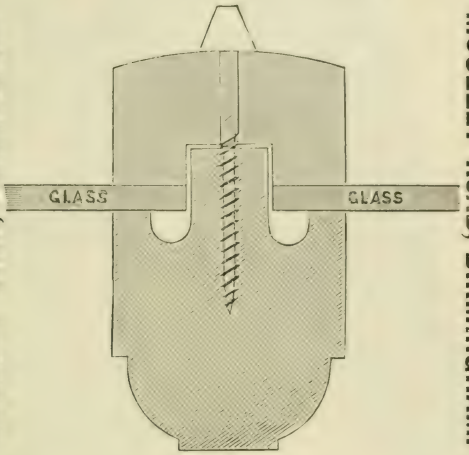
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For Horticultural Buildings.

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AFTER many years experience with Horticultural Buildings and trials of systems of glazing, we have found that this plan is the best yet discovered, and has answered admirably everywhere where it has been tried. Each bar is made in two parts and the lower half has a raised fillet in the centre and on each side of this fillet is a groove. The lower half is fixed at the top and bottom to the radial ribs with the grooves upwards, a copper clip is fixed at the lower end of the bar, the panes of glass are laid on with their edges coming up to the side of the raised fillet and, to prevent their slipping out of position, the copper clip is turned up and lies flat upon the upper surface of the glass. The cap forming the upper part of bar is grooved to fit the raised fillet of the lower portion of the bar, and the two are screwed firmly together, the glass being thus secured between by the use of three square-headed copper screws made specially for the purpose. The two halves when screwed together form a water gutter from end to end, consequently should any water find its way in at the edges of the glass it runs down the grooves to the outside and cannot possibly find its way into the house.

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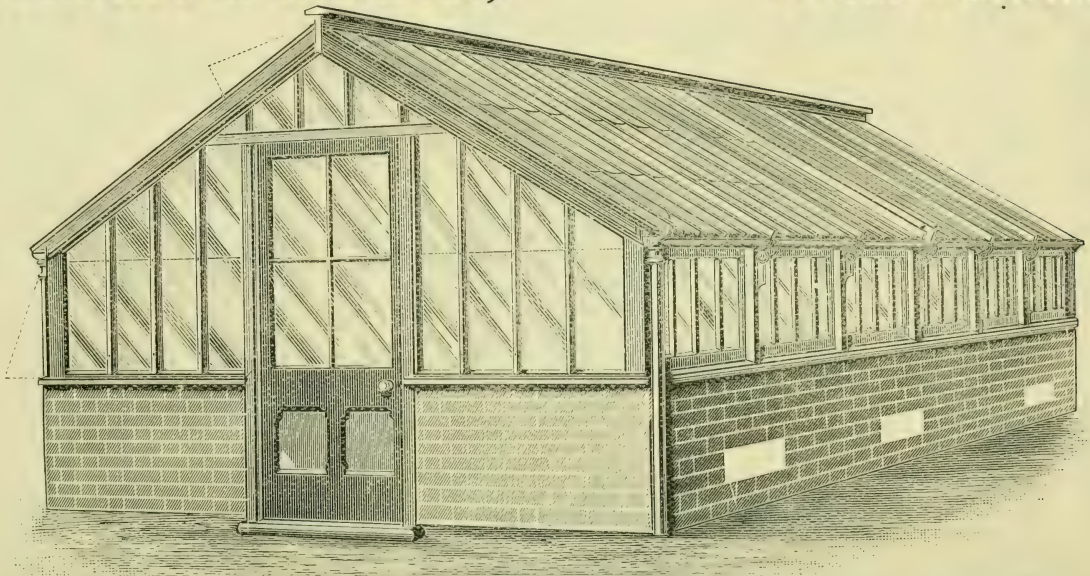


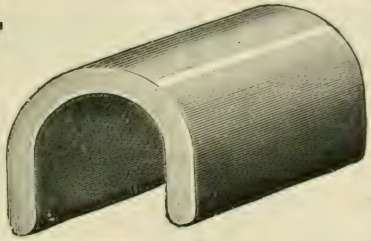
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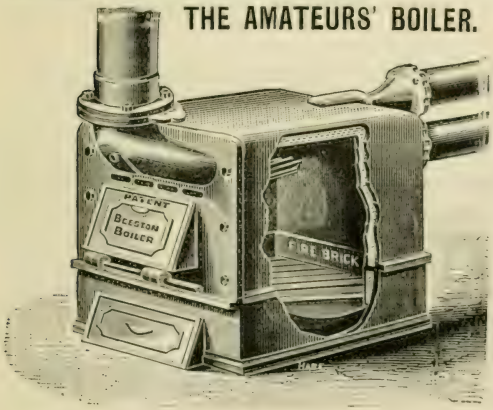


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No.	Size of Boiler. long.	inside arch.	Approximate Heating Power. 4in. Pipe.	Price of Boiler. No. 17.	Price of Boiler. No. 18.
	L.	W. D.	ft.	£ s. d.	£ s. d.
1	18	× 10 × 11	200	2 7 6	
2	18	× 12 × 12	250	2 17 6	
3	21	× 10 × 11	225	2 15 0	
4	21	× 12 × 12	275	3 2 6	
5	24	× 10 × 11	250	2 17 6	
6	24	× 12 × 12	300	3 7 6	
7	24	× 14 × 14	350	3 17 6	5 17 6
8	27	× 12 × 12	325	3 15 0	5 12 6
9	27	× 14 × 14	375	4 5 0	6 10 0
10	30	× 12 × 12	350	4 0 0	6 2 6
11	30	× 14 × 14	425	4 17 6	7 2 6
12	33	× 12 × 12	400	4 10 0	6 15 0

THE AMATEURS' BOILER.



Height.	Width.		To heat 4in. pipe.	£ s. d.
24	15	× 15	36 ft.	2 15 0
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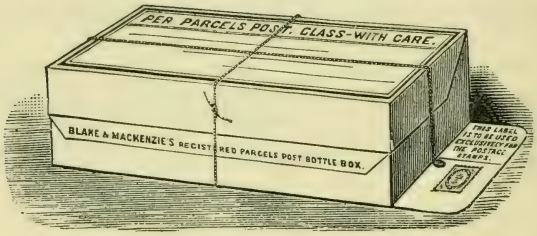
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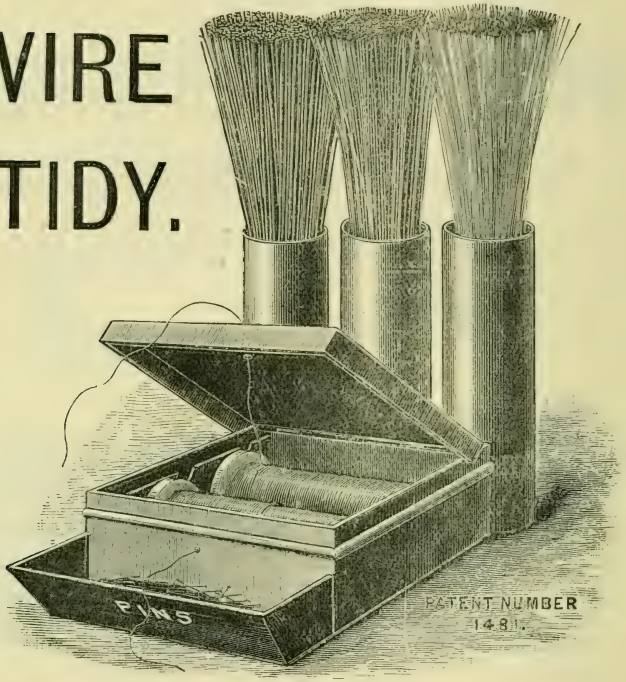
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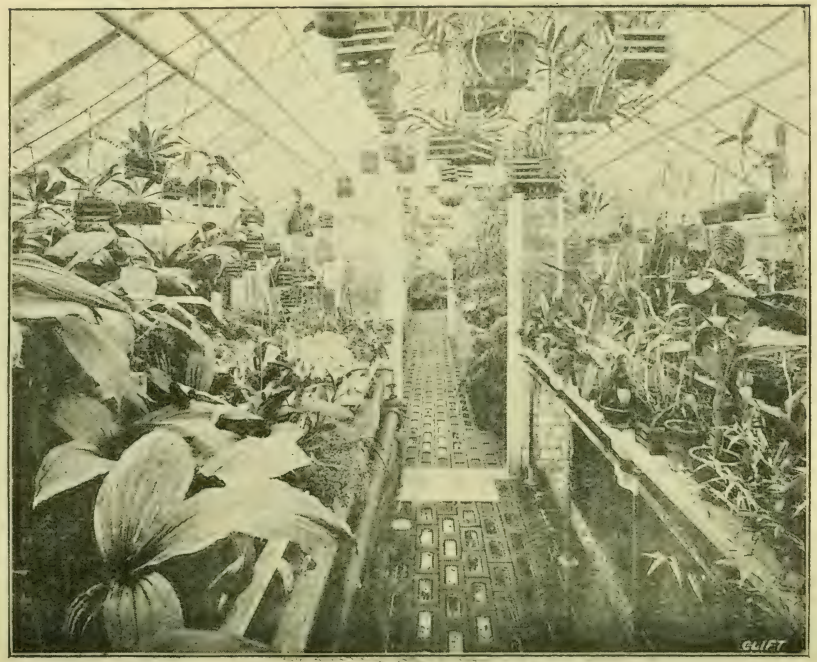
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